

ESSENTIAL DRUGS FOR PRIMARY HEALTH CARE

**A Manual for
Health Workers
in South-East Asia**



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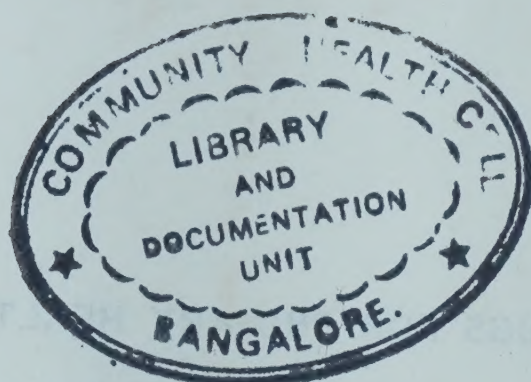


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DR 410

ISBN 92 9022 185 2

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Printed in India

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CORRIGENDA

Page 8

Add the following to the third paragraph under "How is it supplied and given to patients?"

"It is prepared by diluting one part of the 20% solution with forty parts of water."

In the fourth paragraph, third line, replace "an equal volume" by "twenty volumes".

Page 37

In item 2, fourth line, add "(1500-2000 ml)" after the phrase "of urine".

Page 38

Replace the existing table "DOSE" with the following table:

Patient's age		Dose
2 - 6 months	50-100 mg. (1/3 - 2/3 teaspoonful)	} 4 times a day, if required
1/2 - 1 year	60-120 mg. (1/2 - 1 teaspoonful)	
1 - 6 years	120-250 mg. (1 - 2 teaspoonful)	
6 - 12 years	250-500 mg. (1/2-1 tablet, or 2-4 teaspoonsful)	
Adults	Give 1-2 tablets repeated after 6 hours, if needed.	

Page 41

Delete the word "usually" from the last sentence of the page, so that the phrase reads as "Treatment is given for 7 days or till 3 days ... "

Page 55

Change the reference from "page 93" to "page 94" in the second line of the second paragraph, under "When should it be used?"

Page 60

In item 3, under "How is it supplied and given to patients?", insert "of Vitamin D" after "3 000 units".

Page 78

In item 2 under "When to refer", replace "(less than per day)" by "(more than per day)".

Page 79

In the seventh line, under item 4, insert "1/4" and "1/2" after the phrase "100 ml" so that the line reads "100 ml (1/4 to 1/2 cup) after each loose stool."

Page 80

In the last line of item 5, insert "1/2" after the phrase "such as walk for".

Preface

The use of primary health care as a key approach towards achieving Health For All by the Year 2000 is now well established. Community health workers and other paramedical personnel are playing an increasingly important role in the delivery of health care. Although the emphasis in the primary health care approach is on health promotion and prevention of disease, health workers must learn how to use simple drugs to treat common illnesses and thus gain the confidence of the community. They also need to learn when to refer to physicians.

Most countries in WHO's South-East Asia Region* have now prepared lists of essential drugs to be used by primary health workers. The drugs have been selected on the basis of their proven quality, efficacy, safety, availability and low cost.

For the proper management of some common illnesses, it is not only necessary to know about the properties, uses and possible adverse effects of essential drugs, but also to have a reasonable knowledge about the ailments. The health worker should also be able to identify the stages of illness that call for assistance from a doctor.

This manual is intended to provide guidelines for the use of essential drugs by community health workers and paramedical/auxiliary health personnel. It also gives guidelines for treating certain common illnesses and identifying situations that need to be referred to the doctor. Furthermore, it provides information regarding the management of injuries due to accidents, burns and poisoning, including snake-bite. This manual should prove useful to trainers of paramedical and health workers.

An attempt has been made to write the manual in a simple language, and to give clear, practical instructions to help the user in making decisions when faced with a specific situation. Wherever necessary, illustrations have been included to amplify the technical information.

The responsibilities given to community health workers and paramedical personnel vary from country to country, as do the number of drugs allowed to be used by such persons. Although a single manual may not be able to fulfil the needs of all countries, it is

*Bangladesh, Bhutan, Burma, DPR Korea, India, Indonesia, Maldives, Mongolia, Nepal, Sri Lanka and Thailand.

hoped that this manual will serve as a core book to which additions or deletions can be made depending upon the specific needs of a country. It is essentially a prototype. Accordingly, the number of drugs and other topics discussed has purposely been kept large in order to facilitate the work of those who will be selecting material and adapting it to suit the specific needs at the country level.

For the proper management of acute common illnesses, it is not only necessary to know about the presentation, signs and possible adverse effects of essential drugs, but also to have a reasonable knowledge about the illnesses. The health worker should also be able to identify the signs of illness that call for attention from a doctor.

This manual is intended to provide guidance for the use of essential drugs by community health workers and paramedical auxiliary health personnel. It also contains guidelines for extending certain common illnesses and identifying situations that need to be referred to the doctor. Furthermore, it provides information regarding the management of injuries due to accidents, burns and poisoning. Injuries that are serious should be referred to a specialist or hospital and health workers.

An attempt has been made to write the manual in a simple language, and to give clear practical instructions for the use of essential drugs. It is hoped that this manual will be useful to health workers and health personnel. Illustrations have been included to clarify the instructions.

The responsibility given to community health workers and paramedical personnel varies from country to country, as do the needs of each country. It is hoped that this manual will be able to fulfill the needs of all countries. It is

Published by the Ministry of Health, Government of India, New Delhi, India. Printed by the Government of India Press, New Delhi, India.

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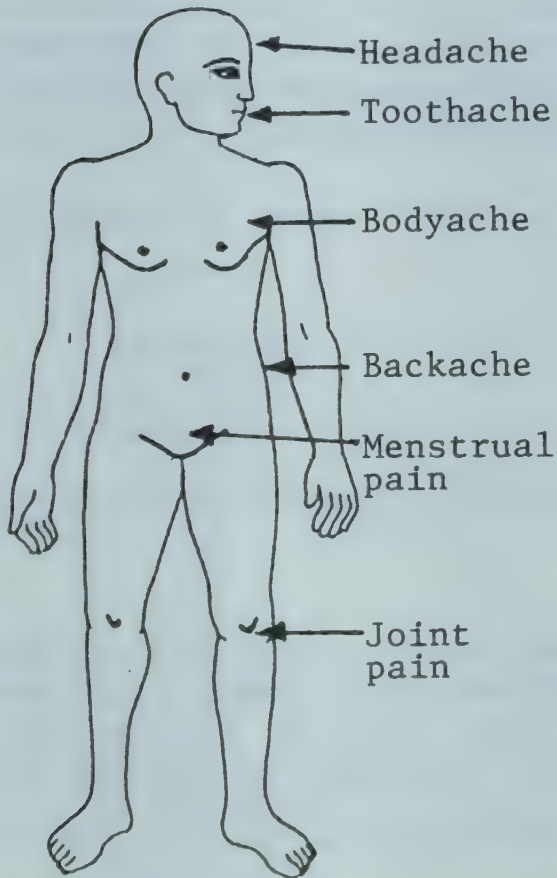
PART I

ESSENTIAL DRUGS: HOW AND WHEN TO USE THEM

1. ASPIRIN

How does it help?

Aspirin (acetylsalicylic acid) relieves pains such as headache, body aches, muscular pain and pain in the joints. It also lowers fever (without correcting the cause, however).



Aspirin has a specific action in a disease called rheumatic fever. This disease usually occurs in children and is associated with swelling and pain in many joints.

Aspirin is not useful for severe pain such as that following an accident, burns or a heart attack.

When should it be used?

1. To relieve pain
2. To lower fever
3. To relieve the symptoms of common cold and influenza
4. For rheumatic fever

How is it supplied and given to patients?



Aspirin is typically supplied in tablets containing 300 mg. of aspirin.

It is given orally, taken along with plenty of water and after some food.

It is mostly used in a single dose for relieving pain and reducing fever. However, the dose can be repeated if pain and fever continue.

Advise plenty of water

In giving aspirin to children, the required amount of tablet is crushed and mixed with syrup or honey. The following doses are

recommended for different age-groups:

DOSE

Child's Age (in years)	Dose
1- 2	50-150 mg., repeated every 8 hours, if necessary. $\frac{1}{2}$ tablet of aspirin may be crushed into powder & half portion given in water with sugar.
3- 5	300 mg., single dose, repeated every 8 hours, if necessary.
6-12	400 mg., repeated every 6 hours, if necessary.
13 and above	300-1000 mg., repeated every 6 hours, if necessary.

What are its side-effects?

Side-effects are mild. Aspirin may cause mild nausea and burning pain in the stomach; rarely, the patient may vomit. In some particularly sensitive people, it may cause ringing in the ears, giddiness and an asthma-like attack. In children suffering from influenza or chickenpox, aspirin may produce a severe reaction (Reye's syndrome).

What precautions should be taken?

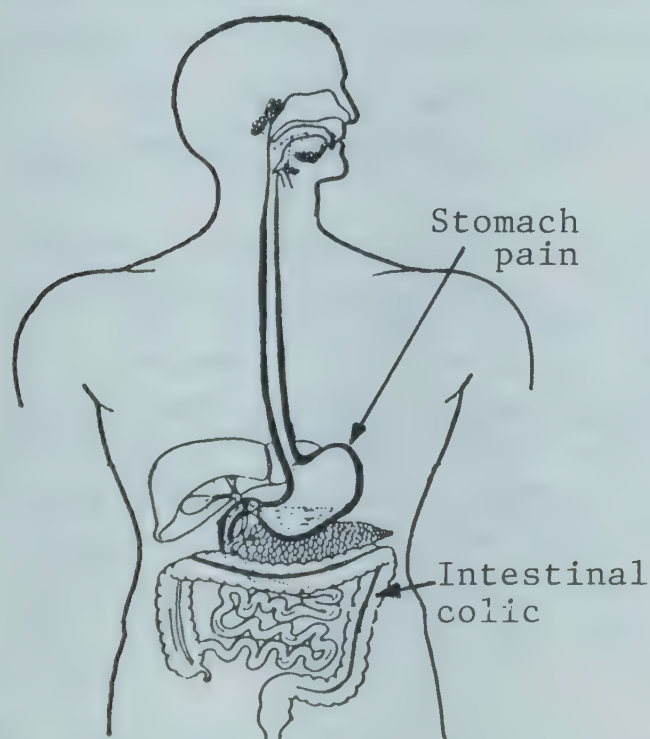
1. Avoid giving aspirin to children to treat influenza or chickenpox. Use paracetamol instead.
2. Avoid aspirin to patients who have nausea and/or stomach pain.
3. Avoid aspirin to patients with a history of intolerance to aspirin (aspirin allergy).
4. Avoid giving aspirin to children under one year of age. Keep the bottle out of reach of children. In general, it is recommended that paracetamol be used to relieve fever and pain in children (see Section on Paracetamol, page 38).
5. Do not give doses larger than those recommended and avoid repeated use for a prolonged time.
6. Children above 2 years, with fever, sore throat and joint pains may have rheumatic fever. They should be given aspirin or paracetamol and referred to the doctor.

2. ATROPINE

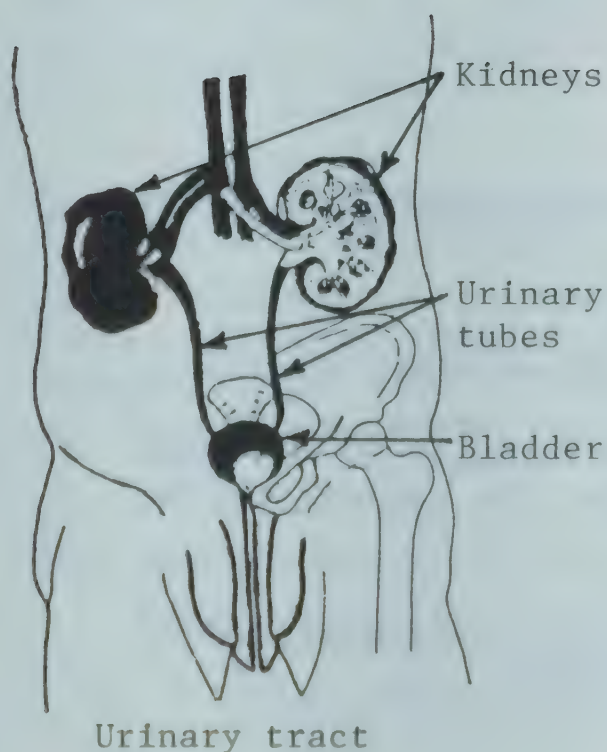
How does it help?

Atropine sulphate relieves spasms of muscles of the intestines, stomach and urinary tract. Contraction of such muscles gives rise to colicky pain in the abdomen. Atropine sulphate also reduces stomach acidity. Further, it counters the toxic effects caused by accidental swallowing of insecticides, such as Tik 20, diazinon and malathion.

When should it be used?



1. Atropine sulphate is most useful for relieving colicky pain in the abdomen arising from spasms of the intestines or the muscles of the urinary tract. Intestinal colic usually produces a "gripping" pain that comes in waves and may be associated with diarrhoea or constipation. Pain from the urinary tract muscles is much more severe and radiates to the scrotum. It may be associated with vomiting and a feeling of exhaustion.



2. Atropine sulphate is also used in combination with aluminium hydroxide or magnesium trisilicate, for treating stomach ulcers, where it helps to reduce the stomach pain.
3. Atropine sulphate can be life-saving in patients suffering from insecticide poisoning. However, it should be given as injection by a doctor in this case. A person who has swallowed insecticide develops nausea, vomiting, abdominal pain and diarrhoea. He may also experience breathing difficulties, muscle weakness and, finally, convulsions that can lead to death.

How is it supplied and given to patients?

Atropine sulphate is given orally as tablets or by injection supplied as:

1. Atropine sulphate tab., 0.6 mg;
2. Atropine sulphate injection, 0.6 mg. to 1 mg./ml. in ampoules, and
3. Belladonna dry extract, 10 mg. tab. (equivalent to 0.1 mg. of atropine).

For abdominal colicky pain in adults, give 1 tablet of atropine orally as a single dose. Children below 10 years may be given $\frac{1}{2}$ tablet.

Belladonna dry extract 10 mg. tab. (equivalent to 0.1 mg. of atropine) may be used in place of atropine sulphate in the dose of 5 tablets as a single dose, repeated if necessary. For children 8-12 years of age, give 2 tablets and for those 5-7 years of age, give 1 tablet; repeat after 8 hours if necessary.

What are its side-effects?

Atropine sulphate may cause dryness of the mouth, blurring of vision, rapid pulse, flushing of skin and feeling of warmth. Old people may experience difficulty in passing urine.

What precautions should be taken?

1. Do not exceed the dose.
2. Do not give atropine to old people, especially those who have difficulty in passing urine or who have any disturbance of vision.
3. Do not give it to persons with known heart disease.
4. If the abdominal pain persists in spite of atropine or belladonna dry extract, refer the patient to the doctor.
5. Patients suspected of insecticide poisoning should be referred to the doctor immediately.

3. BENZYL BENZOATE

How does it help?

This drug, when applied to the body, kills the itch mite, a tiny insect that causes scabies. The itch mite usually resides between the fingers, on the wrist, flexures and in between the buttocks. It is also found in palms, soles, breasts and the penis. It causes small sores with intense itching, which is usually worse at night. Following scratching, these sores get infected with the formation of pus. Scabies is a disease caused by unhygienic conditions and spreads through close body contact and infected clothes.

When should it be used?

Benzyl benzoate should be used to treat scabies and, occasionally, in treatment against body lice.

How is it supplied and given to patients?

Benzyl benzoate is supplied as an emulsion containing 25 per cent of benzyl benzoate. In adults, it is used as supplied. For use in children, it is diluted with an equal volume (1:1) of clean water. For use in infants, one part is mixed with three parts of water (1:3).

Benzyl benzoate is applied over the whole body below the neck, preferably after a hot bath. The application is painted on the dry skin and left for 24 hours. Every time hands are washed, the emulsion should be applied again. It is repeated once, without a further bath. At the end of two days, all the lotion is scrubbed off in a hotwater bath.

What are its side-effects?

Benzyl benzoate is an irritant to the skin. Hence, only the diluted lotion should be used in children. For the same reason, it is not applied to the face or neck. Care should be taken to avoid getting any benzyl benzoate in the eyes.

What precautions should be taken?

1. All members of the affected person's family, or at least those sharing the person's bed, should be treated at the same time.

2. In order to effect a complete cure, cover the whole body below the neck with benzyl benzoate.
3. Bathe and scrub the body before and after the course of treatment.
4. If the patient also has, or develops, a skin infection, treat it with oral sulphadimidine (see Section on Sulphadimidine, page 52).
5. Explain to the patient that the itch may sometimes persist for as long as three weeks and that the application must not be repeated during this period. However, you may give the patient some chlorpheniramine to control itching (see Section on Chlorpheniramine, page 12).
6. Following the treatment, all infected clothing and bedding should be disinfected by boiling, steaming or airing in the hot sun.

4. CALAMINE LOTION

How does it help?

Calamine lotion, when applied to the skin, has a protective and soothing effect, as well as having a mild antiseptic action. Calamine is a pink-coloured powder that is not soluble in water. Its chemical name is zinc carbonate. The lotion is initially watery. When it is applied to the skin, the evaporation of water produces a cooling effect; any oozing of pus is reduced.

When should it be used?

It is used to produce a soothing and protective effect on skin lesions caused by sunburn, eczema or allergic rash. Eczematous patches usually occur on the front aspect (dorsum) of feet, hands and ears. Eczema and other allergic rashes are associated with itching. They can be distinguished from fungal skin diseases, such as ringworm, by the fact that allergic rashes do not cause scaling and that the borders of patches are not red and raised. Calamine lotion helps to reduce itching and allows the affected skin to heal naturally. It may also be applied to insect bites or stings for its soothing effect.

How is it supplied and given to patients?

Calamine is supplied as a pink-coloured lotion containing 15 g. calamine, 5 g. zinc oxide, 3 g. bentonite, 0.5 g. sodium citrate, 0.5 g. liquified phenol, and 5 ml. glycerol in 100 ml. freshly boiled and cooled water.

Calamine is applied locally with clean cotton, without rubbing. If pus is oozing from the skin, the lotion should be applied repeatedly, so that the skin does not become excessively dry.

What are its side-effects?

Calamine has no side-effects if applied externally.

What precautions should be taken?

Do not apply to ulcers and infected skin lesions associated with pus.

5. CHLORHEXIDINE

How does it help?

Chlorhexidine is an antiseptic that is applied to the skin. It acts against many bacteria but has no action against bacteria that cause tuberculosis. Nor is it effective against fungal diseases such as ringworm. When applied to the skin, it is well tolerated and hence is useful for treating, or preventing, skin infections.

When should it be used?

1. Chlorhexidine is used to treat superficial skin infections, such as superficial ulcers, abrasions and boils.
2. It is used as an antiseptic solution to clean the skin, for example in the cleaning of the vulva and perineum during labour.
3. It can also be used for mouth washes and for the washing of hands before carrying out any surgical procedures.

How is it supplied and given to patients?

Chlorhexidine gluconate is available as a 20 per cent concentrate solution and chlorhexidine hydrochloride in a powder form.

It is used in the form of a diluted solution or an ointment to be applied locally.

Chlorhexidine gluconate 0.5 per cent is used for washing hands before any surgical procedure and for cleaning the skin.

It is used in bathing mothers and babies in maternity units, as a 0.02 per cent solution, prepared by diluting 0.5 per cent solution with an equal volume of clean water. Solution of the same strength can also be used for cleansing wounds.

Chlorhexidine hydrochloride (1 per cent) is used as a dusting powder or as an ointment for application to ulcers and skin infections.

For use as a mouth wash, 0.1 per cent of chlorhexidine gluconate solution is used thrice daily and held in the mouth for one minute. This solution can be prepared by diluting 1 ml. of 20 per cent

concentrate solution to 200 ml. with drinking water, preferably boiled and cooled, or by diluting 2 ml. of 0.5 per cent solution to 10 ml. with drinking water.

What are its side-effects?

In some rare cases, chlorhexidine may cause allergic rash. The concentrated solution may cause irritation of the mucous membranes.

What precautions should be taken?

1. Do not mix chlorhexidine with soap.
2. Cork and cork liners inactivate chlorhexidine and hence should not be used for containers in which chlorhexidine is stored.
3. Do not use chlorhexidine in the ears of patients with perforated ear drums.
4. Store chlorhexidine solution in a cool, dark place protected from light.
5. Do not store diluted solution for more than 2 days.

6. CHLOROQUINE

How does it help?

Chloroquine acts against the parasite that causes malaria. The parasite is introduced into the human body through a mosquito bite. A patient with malaria has repeated attacks of high fever with marked rigors. The fever keeps coming back at intervals. Between the fever attacks, the body temperature remains normal. The fever may be accompanied by headache and backache. Chloroquine suppresses the attack and cures most forms of malaria.

When should it be used?

Chloroquine is highly effective in most cases of malaria. It can be given safely to children and pregnant women. In a few cases, however, it can fail. This occurs when the malaria parasites are resistant to chloroquine.

How is it supplied and given to patients?

Chloroquine is supplied as tablets containing 150 mg. of chloroquine base, which is equivalent to tablets containing 200 mg. of chloroquine sulphate, or to tablets containing 250 mg. of chloroquine phosphate. The syrup contains 50 mg. of chloroquine base per 5 ml. (1 teaspoonful). Chloroquine is usually given orally as tablets or syrup. In severe cases associated with vomiting, injection of chloroquine is used by doctors.

DOSE

Patient's Age (Years)	Day of treatment	Dose Regimen
Upto 1	1	$1\frac{1}{2}$ teaspoonsful ($\frac{1}{2}$ tab.) initially and repeat after 6 hours.
	2 & 3	$\frac{1}{2}$ teaspoonful ($\frac{1}{4}$ tab.)
1-3	1	3 teaspoonsful (1 tab.) initially, and 2 teaspoonsful ($\frac{3}{4}$ tab.) 6 hours later
	2 & 3	$1\frac{1}{2}$ teaspoonsful ($\frac{1}{2}$ tab.)
4-6	1	2 tabs. initial and 1 tab. 6 hours later
	2 & 3	$\frac{1}{2}$ tab.
7-11	1	2 tabs. initial and 1 tab. 6 hours later
	2 & 3	1 tab.
12 & above	1	4 tabs. initial and 2 tabs. 6 hours later
	2 & 3	2 tabs.

Note: If it is possible to weigh the child, you can calculate how much chloroquine to give the child as follows: give 15 mg. per kilogram of body weight on the first day and 5 mg. per kilogram on the second and third day.

Chloroquine is also used in preventing malarial attacks. When visiting known malarial areas, advise people to take the following doses:

DOSE

Patient's Age (Years)	Patient's Weight (Kg.)	Dose
Under 1	up to 5 kg.	1½ teaspoonsful once a week
1-5	5 to 20 kg.	3 teaspoonsful once a week
6-12	20 to 40 kg.	1½ tabs. once a week
Above 13	Over 40 kg.	2 tabs. once a week

What are its side-effects?

Chloroquine is very bitter and can cause stomach upset, nausea and sometimes vomiting. It may sometimes also cause a rash. However, chloroquine is safe, given in the doses recommended above.

What precautions should be taken?

1. Take a blood smear from the patient before starting treatment and send it to a laboratory for examination to confirm the diagnosis of malaria.
2. Use chloroquine in all suspected cases of fever with rigor.
3. Do not administer the tablet on an empty stomach. Wait until after the patient has eaten.
4. For preventive use, start administering the drug a day before the likely exposure to malaria and continue on a weekly basis for at least four weeks after leaving a malarious area.
5. Children may be unable to swallow the tablet because it is so bitter. If chloroquine syrup is not available, give the children the crushed tablet mixed with honey or thick syrup.
6. If a patient with fever with rigor also has vomiting, becomes delirious or develops a stiff neck, give him chloroquine and refer him immediately to a doctor.

7. CHLORPHENIRAMINE

How does it help?

Chlorpheniramine (chlorphenamine) is useful in the treatment of allergies. Some people have reactions to allergens, which may be certain foods, perfumes, toiletry articles, chemicals, plastics, synthetic fibres, drugs and even certain plants, flowers and animal hair. Allergic reactions occur after eating, inhaling or touching such agents. Patients start to itch, develop a skin rash in the form of tiny raised red areas, their noses run, their eyes become red, and they experience breathlessness or wheezing. Occasionally, they get fever and joint pains. These symptoms are due to the release of a substance called histamine in the body in response to the allergen. A severe allergic attack can even result in a drop in blood pressure and shock. Chlorpheniramine gives relief in such conditions.

When should it be used?

- 1. Chlorpheniramine can be used to treat allergic reactions. It does not correct the cause of allergy. The cause should be identified, if possible, by trying to find out what the patient ate, drank or breathed prior to the onset of the allergic reaction.
- 2. Chlorpheniramine can be used to treat allergic drug reactions, such as those which may occur following the administration of pencillin or sulphonamides.
- 3. Chlorpheniramine can be used for allergic reactions following insect bites.

How is it supplied and given to patients?

Chlorpheniramine is given orally. It is supplied as tablets containing 4 mg. of chlorpheniramine maleate and syrup containing 2 mg. of chlorpheniramine maleate per 5 ml. (one teaspoonful).

DOSE

Patient's Age (Years)	Dose
Upto 1	1 mg. ($\frac{1}{2}$ teaspoonful) twice daily
1-5	1 mg. ($\frac{1}{2}$ teaspoonful) three times daily
6-12	2 mg. ($\frac{1}{2}$ tablet or 1 teaspoonful) three times daily
13 and over	4 mg. (1 tab.) three times daily

It is also given by injection in emergency situations.

What are its side-effects?

Chlorpheniramine may cause mild drowsiness, mental dulling and dryness of the mouth.

What precautions should be taken?

1. All patients who have an allergic reaction associated with a fall in blood pressure should be referred to a doctor immediately.
2. The patient should be informed that his ability to drive a car or operate a machine may be temporarily affected.
3. The patient should be advised not to drink any alcohol during chlorpheniramine therapy.
4. The drug should not be used for more than four days and the dosage should not be exceeded. If there is no response, the patient should be referred to a doctor.

8. CODEINE

How does it help?

Codeine has three important properties: it suppresses dry, irritating coughs, relieves mild to moderate pain, and induces constipation.

When should it be used?

1. Codeine is used to suppress a dry, irritating cough, particularly when it disturbs the sleep. This is a purely temporary measure to make the patient comfortable. It is more important to treat the disease which is causing the cough.
2. Codeine can be used to relieve mild to moderate pain. It acts differently from aspirin, with which it can be combined for more potent action. This may be necessary in patients with severe body aches, joint pains, accidental injuries or burns.

How is it supplied and given to patients?

Codeine is given orally. It is supplied as tablets containing 15 mg. of codeine phosphate and as syrup containing 15 mg./5 ml. (one teaspoonful) of codeine phosphate.

DOSE: As a cough suppressant in adults, 5 ml. (one teaspoonful) of the syrup is given three times a day. For children 1-5 years old, 1 ml. of syrup ($\frac{1}{4}$ teaspoonful) is given three times a day, and for children 6-12 years, 2.5 ml. ($\frac{1}{2}$ teaspoonful) of syrup is given three times a day. Codeine should not be used for more than four days.

In order to relieve pain in adults, give two tablets (30 mg.) initially and repeat this dose at 8-hour intervals, if necessary. This dose should not be given for a consecutive period of more than 48 hours.

What are its side-effects?

Codeine causes constipation, drowsiness and dizziness. Old people may experience difficulty in passing urine.

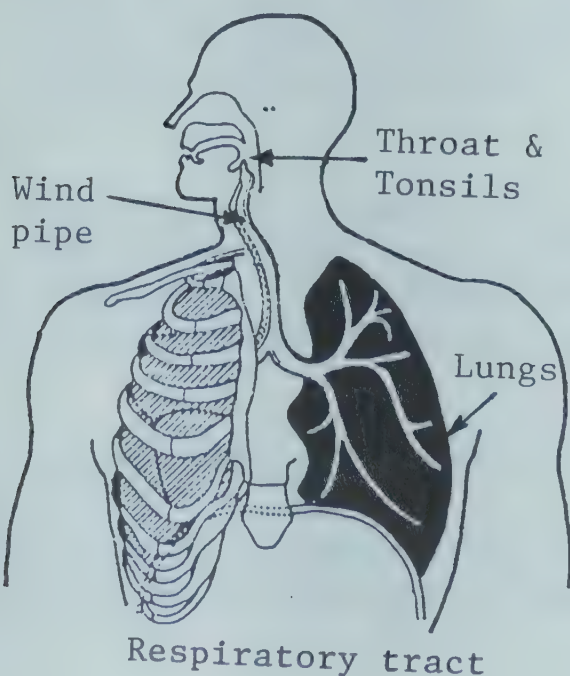
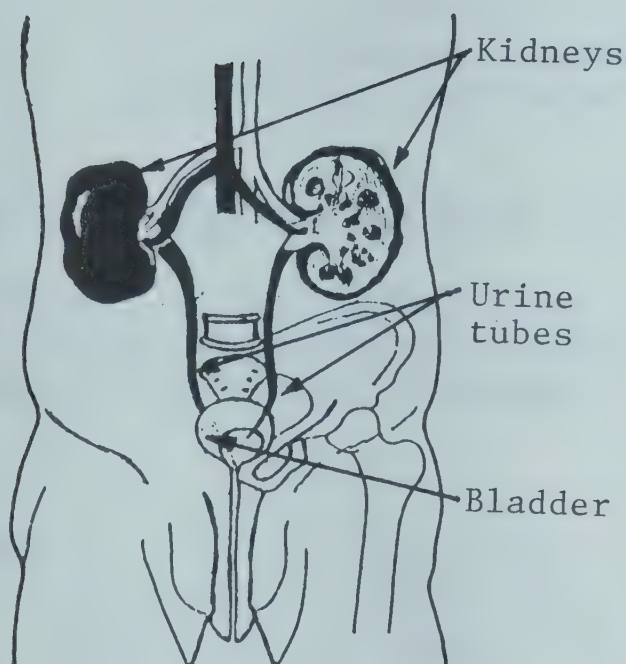
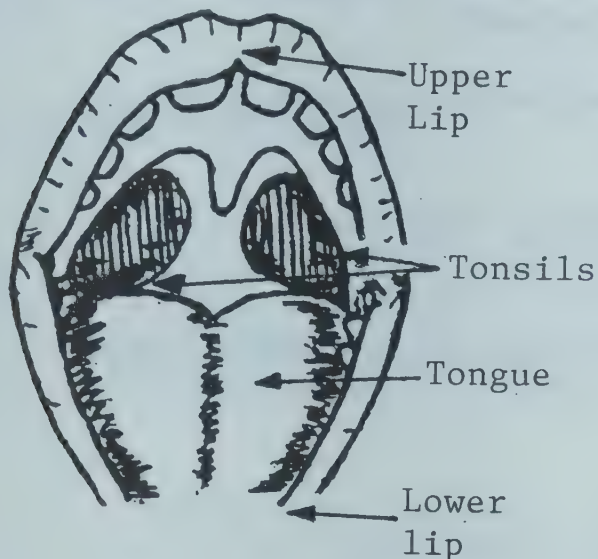
What precautions should be taken?

1. Codeine is used as a temporary measure to make the patient comfortable. Do not exceed the dose or duration of therapy.
2. Avoid giving to children below 1 year of age, to old people and to women in late pregnancy.
3. Do not use codeine to treat patients who complain of a cough of long standing.
4. Avoid giving codeine to persons with known liver disease or jaundice.
5. Advise the patient to avoid drinking alcohol during codeine treatment.

9. CO-TRIMOXAZOLE

How does it help?

Co-trimoxazole is a mixture of two drugs: 5 parts of sulphamethoxazole (a sulphonamide) and 1 part of trimethoprim. It cures infections caused by certain types of bacteria. It is not effective in virus infections such as common cold, influenza and chickenpox, nor in tuberculosis and leprosy. It can be used in patients who cannot tolerate penicillin, or when it is not possible to administer injectable penicillin.



It cures infections caused by certain types of bacteria. It is not effective in virus infections such as common cold, influenza and chickenpox, nor in tuberculosis and leprosy. It can be used in patients who cannot tolerate penicillin, or when it is not possible to administer injectable penicillin.

When should it be used?

1. In the treatment of the infection of tonsils called tonsillitis. Ask the patient to open his mouth and look at the tonsils and throat in good light. In tonsillitis, the tonsillar glands situated on either side of the base of the tongue are swollen and red. They may also show whitish/greyish spots. The patient usually complains of pain in the throat and difficulty in swallowing. In children, if you see grey membrane adherent to the throat, suspect diphtheria and refer to a doctor.
2. In urinary tract infections. In such conditions, the patient complains of pain in the groin, fever, and burning while passing urine.
3. In acute respiratory infections. These are characterized by fever, cough and yellow sputum. In children, a cough associated with rapid breathing, fever and chest indrawing suggests acute respiratory infections.

- 4. In the treatment of acute dysentery caused by bacteria. In this condition, the patient passes large, liquid, watery stools, frequently with blood or mucus.
- 5. In abscess and skin infections. Co-trimoxazole can also be used in the treatment of abscess and skin infections in patients allergic to penicillin.
- 6. In chancroid. This is also a sexually transmitted disease. The patient has a painful ulcer in the penis with swellings in the groin.
- 7. In the treatment of typhoid fever. Typhoid fever occurs as a continuous fever and it does not respond to penicillin or sulphadimidine. Any continuous high fever lasting more than 4-5 days should be suspected as typhoid and referred to the doctor.

How is it supplied and given to patients?

Co-trimoxazole is given orally. It is supplied as co-trimoxazole tablets containing 480 mg. each. A syrup for use in children contains 240 mg./5 ml. (one teaspoonful). However, syrup is expensive and may deteriorate in tropical countries.

DOSE

Patient's Age (Years)	Dose
Up to 1	$\frac{1}{4}$ tablet crushed and mixed with honey or sugar and water twice daily
1-5	$\frac{1}{2}$ tablet administered as above twice daily
6-12	One tablet twice daily
13 and over	Two tablets twice daily

If the child can be weighed, you can calculate the proper dose on that basis: give 60 mg. per kg. per day in two divided doses.

The treatment is continued for 7 days in case of tonsillitis, dysentery and acute respiratory infections and for 14 days in case of urinary tract infections.

What are its side-effects?

Co-trimoxazole may cause mild gastric upset. It may also occasionally produce skin rashes, or liver damage or result in a decrease in blood cells.

What precautions should be taken?

1. Do not use this drug if the patient has a history of rashes and fever following any sulphonamide. Similarly, if you notice a skin rash or if the patient complains of joint pains following the treatment, do not continue the drug.
2. Ensure that patients pass an adequate amount of urine before and during treatment by advising them to drink plenty of water.
3. Do not use the drug during pregnancy and in infants under 6 weeks of age, or in patients with known liver damage or decreased urine output.
4. Do not continue to give the drug beyond the recommended period. If the patient does not improve within four days of starting therapy, refer him to the doctor.

10. EPHEDRINE

How does it help?

This drug relaxes the muscles of the respiratory tract and thus relieves the difficulty in breathing seen in asthma patients. In asthma, the patient has repeated attacks during which the breathing tubes become narrow, causing the patient to wheeze and experience difficulty in breathing. When asthma patients take a breath, the skin behind the collar bones and between the ribs may be sucked in. There is no fever. An attack is often set off by eating or inhaling particular food items, chemicals or flower pollen to which the patient is allergic. Asthma often begins in childhood and usually runs in a family.

Ephedrine also gives some relief to patients afflicted by itching and body rash caused by an allergy.

When used as nasal drops, ephedrine can open up nostrils blocked by an attack of common cold.

When should it be used?

1. In the treatment of asthma. Ephedrine should be used as soon as the attack starts and be repeated after 6 hours, if needed. It can also be used to prevent an attack in a known asthmatic patient.
2. In mild cases of allergic rash and itching. In these conditions, it is used three times daily for five days.
3. To relieve the blocking of nostrils occurring during an attack of common cold.

How is it supplied and given to patients?

Ephedrine is supplied as tablets containing 30 mg. of ephedrine hydrochloride, for oral administration. Syrup preparations for use in children contain ephedrine hydrochloride 15 mg. per 5 ml. (1 teaspoonful).

Nasal drops for instillation in the nose contain 0.5 per cent of the drug.

DOSE

Patient's Age (Years)	Dose
Up to 1	$\frac{1}{2}$ teaspoonful syrup repeated after 8 hours, if necessary
1-5	One teaspoonful of syrup repeated after 8 hours, if necessary
6-12	$1\frac{1}{2}$ teaspoonsful of syrup repeated after 8 hours, if necessary
13 and over	One tablet as soon as attack starts, repeated after six hours, if necessary. For prevention of attack, one tablet twice daily.

NOTE: For nasal blockade, instil 1-2 drops into each nostril when required. Avoid repeated and excessive use.

What are its side-effects?

1. It increases the heart rate. This can be observed by counting the pulse.
2. It causes restlessness and, if given at bedtime, disturbs the sleep.
3. In old people, it may cause retention of urine.

What precautions should be taken?

1. Do not exceed the doses mentioned. If there is no response, refer the patient to the doctor.
2. Avoid giving ephedrine to a patient who has heart disease or high blood pressure.
3. Avoid giving it to people over 60 years of age.
4. Avoid the drug at bedtime, especially in patients who experience difficulty in sleeping soundly.
5. Patients with asthma usually have a history of repeated attacks. Do not use ephedrine in an elderly person who develops difficulty in breathing for the first time, particularly if he also has chest pain and is sweating. He may be having a heart attack and should be referred to the doctor immediately.

11. FERROUS SULPHATE (Iron preparation)

How does it help?

Ferrous sulphate contains iron, which is necessary for the production of haemoglobin, which gives red colour to the blood. Deficiency of iron causes deficiency of haemoglobin resulting in anaemia. An anaemic person looks pale, feels weak and gets tired easily. In severe cases swelling of the feet may develop. Iron-deficiency anaemia is common in women of child-bearing age owing to loss of blood in menstruation and following repeated pregnancies. Patients who suffer from bleeding piles, stomach ulcer or hookworm infestation also suffer from such anaemia. Administration of ferrous sulphate corrects iron deficiency and cures this type of anaemia. It is the cheapest iron preparation available.

When should it be used?

1. In the treatment of iron-deficiency anaemia.
2. It is also used to prevent anaemia in pregnant women, young children and in women who complain of heavy blood loss during menstruation.

How is it supplied and given to patients?

It is supplied as tablets containing 200 mg. of dried ferrous sulphate. It is given orally. For children, a tablet can be crushed and given mixed with honey or syrup.

DOSE

Patient's Age (Years)	Dose
Up to 1	$\frac{1}{4}$ tablet powdered and mixed with honey or milk twice daily ($\frac{1}{4}$ the portion of a crushed tablet)
1- 5	$\frac{1}{2}$ tablet powdered and mixed with honey or milk twice daily
6-12	One tablet twice daily
12 and over	One tablet thrice daily

Continue the treatment for 6 months.

For the prevention of anaemia in adults, give one tablet daily.

DR 410



What are its side-effects?

In a few cases it causes stomach ache, nausea, diarrhoea or constipation.

What precautions should be taken?

1. If the initial dose causes stomach upset, use a smaller dose and increase it gradually.
2. Instruct the patient to take the dose after food and not on an empty stomach. Mothers should be told to give iron preparations to a child after food.
3. If the patient is unable to tolerate ferrous sulphate, refer him to the doctor.
4. Keep the iron tablets, which are usually sugar coated, away from children. Swallowing of such tablets in large amounts as candy by children can cause death.
5. In pregnancy or in patients with general nutritional deficiency, give iron tablets containing ferrous sulphate and folic acid. Of course, correction of diet and food habits is more important.
6. While under treatment, refer the patient to the doctor for finding out the cause of anaemia, which can be corrected.

12. FOLIC ACID

How does it help?

It is a member of the vitamin B complex group. It is present in green vegetables, liver, meat and yeast. Deficiency of this vitamin causes anaemia. The body requirement of this vitamin is higher during pregnancy and growth. Its deficiency is common in under-nourished people. Administration of folic acid in such cases corrects this type of anaemia.

When should it be used?

1. In anaemia resulting from under-nutrition: In such cases folic acid deficiency occurs as a part of general nutritional deficiency and this should be corrected while supplementing folic acid. In people with marked folic acid deficiency, in addition to anaemia there is marked weight loss, and the mouth cavity and tongue show inflammation and sometimes ulcers. Patients may complain of a burning sensation in the mouth following the usual spicy food.
2. During pregnancy and lactation, when it is used in combination with iron to prevent anaemia.

How is it supplied and given to patients?

It is supplied as 5 mg. tablets. In children, it can be given as a syrup containing 2.5 mg. per 5 ml. (1 teaspoonful).

In the treatment of established folic acid deficiency and malnutrition, it is used in the dose of 5 mg. thrice daily (3 tablets) for 3 weeks and subsequently 5 mg. (1 tablet) daily for another 2 weeks. For preventing folic acid deficiency during pregnancy and lactation, it is started from the fourth month onwards in the dose of 0.5 mg. daily and is usually combined with one tablet of ferrous sulphate and is continued throughout pregnancy. For the treatment of deficiency in children -

DOSE

Patient's Age (Years)	Dose
Up to 1	2.5 mg. (1 teaspoonful) daily
1 - 5	5 mg. (2 teaspoonsful) daily
6 - 10	10 mg. (2 tablets) daily

Treatment should be continued for 4 weeks.

What are its side-effects?

None.

What precautions should be taken?

Although folic acid and iron correct anaemia, the patient should be referred to the doctor to find out the cause of anaemia, which needs be corrected.

13. GENTIAN (CRYSTAL) VIOLET

How does it help?

Gentian violet is a purple-coloured dye available in powder form. When applied as a solution, it has an antiseptic action against a number of bacteria and certain fungi which cause infection of the skin and the mucous membrane.

When should it be used?

1. It is used locally in the form of a solution to treat boils, burns and infections of the skin.
2. It is used as an antiseptic to treat chronic ulcers.
3. It is used to treat fungal infections of the skin and the mucous membrane of the mouth and the vagina. The fungus infection in the mouth presents as creamy white/grey patches which may be deep and extensive enough to cause difficulty in swallowing. It is particularly useful for the fungal infection which affects the skin between the toes and fingers; there is soddening of skin and itching.

How is it supplied and given to patients?

It is supplied as a watery solution 0.5 per cent to be applied undiluted locally to the lesions.

What are its side-effects?

None.

What precautions should be taken?

Remember - it stains clothes.

14. ISPAGHULA

How does it help?

These are dried seeds of a plant. They are hard, dull white in colour - and contain slimy material. When put in water, the seeds absorb water and swell. When such a mixture is swallowed, ispaghula are not digested but remain swollen, thus contributing to the bulk of the faecal matter. This results in the evacuation of the bowel.

When should it be used?

It is used to treat constipation. It is safe, does not cause griping pain in the abdomen and reduces the need for straining at the time of passing stools. Ispaghula is particularly useful in the treatment of constipation in old people, in people with heart diseases, during pregnancy and in patients with piles or anal fissure.

How is it supplied and given to patients?

It is supplied as ispaghula husk, dull white in colour, or as a processed powder. The required amount of seeds or powder is mixed with a glass of water or milk and a small amount of sugar is added to taste. The mixture is stirred and then taken orally, usually at bedtime. It causes evacuation the next morning.

DOSE: For adults give two teaspoonsful of husk or powder in a glass of water or milk, once daily.

For children give $\frac{1}{2}$ to 1 teaspoonful mixed with water or milk once daily.

What are its side-effects?

It is safe and well tolerated. Rarely, it may cause distension of the abdomen and formation of gas.

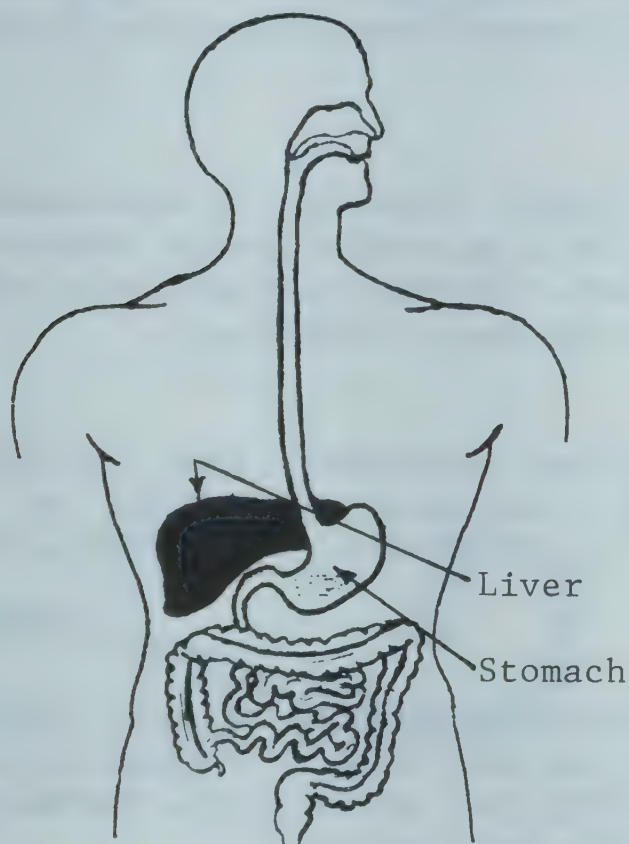
What precautions should be taken?

1. Instruct the patient to take plenty of water.
2. Do not give it to a patient who develops sudden constipation, associated with abdominal pain, vomiting and tightness of abdominal muscles. Such cases should be referred to the doctor.
3. Ispaghula should not be swallowed dry.

15. MAGNESIUM TRISILICATE/ALUMINIUM HYDROXIDE

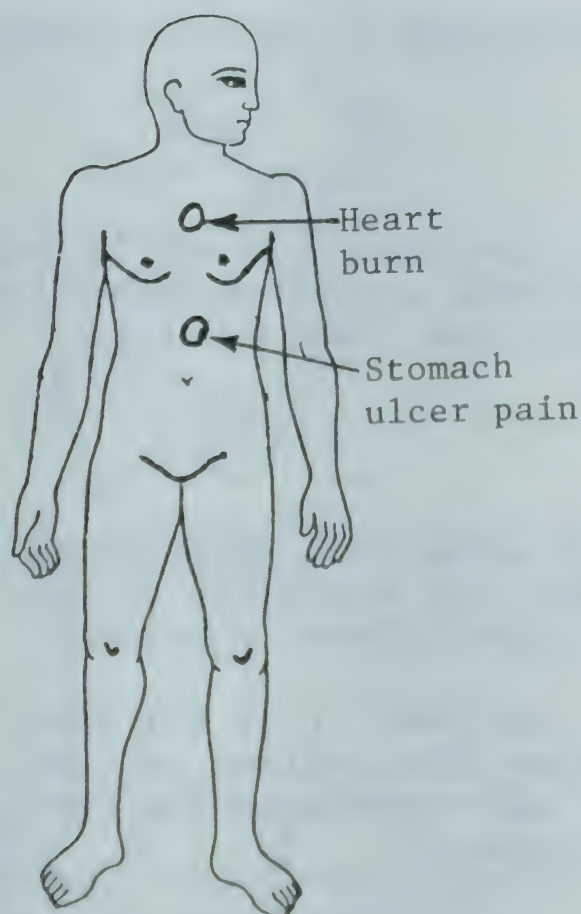
How does it help?

Both magnesium trisilicate and aluminium hydroxide neutralize the acid in the stomach. They are called antacids. Either of them, when given orally, gives relief from the abdominal pain due to irritation of stomach, stomach ulcer, or heartburn (pain behind the breastbone occurring after food). It also relieves the feeling of bloating after food. These drugs form a gel-like material with water. The gel covers the stomach lining and thus exerts a protective effect.



When should it be used?

1. In the treatment of stomach irritation and stomach upsets following the eating of certain irritant foods.
2. In the treatment of suspected or known stomach ulcers, where it is used in larger doses and over a longer period. It not only relieves pain but also helps the ulcer to heal. For this purpose it is better than sodium bicarbonate.



Pain due to stomach ulcer usually occurs in the upper abdomen. It may be described as 'hunger pain', which slowly builds up, is steady for 1-2 hours and then gradually subsides. Sometimes, the patient may describe it as 'burning'. The pain is promptly relieved by taking food or antacid drugs but reappears within 2-3 hours. Pain that awakens the patient from sleep 1-2 hours after retiring is characteristic of stomach ulcer.

3. In patients who complain of regurgitation of sour (acid) stomach juice and pain behind the breastbone (heartburn) after eating.

How is it supplied and given to patients?

It is supplied as tablets containing 500 mg. of magnesium trisilicate or aluminium hydroxide. Magnesium trisilicate is also available as powder for dispensing.

Any one of these drugs can be given alone or in combination, orally, either as a chewable tablet or a mixture. Though mixture is more effective, tablets are convenient. Magnesium trisilicate given in powder form or tablet works out to be most 'economical'.

DOSE: For indigestion due to acidity and heartburn, give 2 tablets of magnesium trisilicate or aluminium hydroxide or an equivalent amount of powder (1 g.) usually after meals, when the symptoms are most intense.

For stomach irritation and suspected stomach ulcers, similar doses are given between meals, and the dose is doubled (4 tab. or 2 g.) at bedtime. If pain persists, additional doses may be given at hourly intervals or less frequently.

For better effect, instruct the patient to chew the tablet.

What are its side-effects?

Neither of the drugs is absorbed and therefore does not produce any serious side-effects. Aluminium hydroxide sometimes causes constipation while magnesium trisilicate may cause loose stools.

What precautions should be taken?

1. Both these drugs, when used along with other drugs prescribed, may interfere with the absorption of the latter; hence, they should be administered separately.
2. If the stomach pain is not relieved or at any time symptoms become worse, refer the patient to the doctor; similarly, refer all patients who get repeated attacks of abdominal pain.

16. MEBENDAZOLE

How does it help?

Mebendazole acts on roundworms and pinworms. In addition, it also acts against hookworms and to a certain extent against whipworms and tapeworms. It is thus useful in the treatment of a variety of worms found in the intestines. Following mebendazole, worms are passed out in the stools.



Pin worms



Round worms



Hookworms



Whipworms



Tapeworm segments

When should it be used?

1. It is a drug of choice in pinworm infestation. Pinworms are white in colour, small, about 0.5-1 cm. in length. The motile worms are found in large numbers in stools, particularly in children. They may also be found in the folds of the skin round the anus and cause itching.
2. It is also useful in roundworm infestation (refer to Piperazine, page 43).
3. It is useful in hookworm disease. Hookworms are small (like a piece of thread) about 1-1.5 cm. in length and whitish in colour. They suck blood from the intestine and thus cause iron-deficiency anaemia.
4. It is also useful to a limited extent in the treatment of whipworm. These are thin worms about 3-5 cm. long and look like tiny whips.
5. Mebendazole is also useful in the treatment of tapeworms. Tapeworms are flat, segmented worms about 3-10 metres long. Segments (1-3 cm.) may be seen in the stools. They are caused by eating infected beef or pork that has not been properly cooked.

How is it supplied and given to patients?

It is supplied as mebendazole tablets 100 mg. and as a liquid preparation containing mebendazole 100 mg. per 5 ml. (1 teaspoonful).

DOSE: For roundworm, pinworm, hookworm and whipworm, it is given as one tablet (100 mg.) twice daily for three days (total 6 tablets).

For tapeworm, give 2 tablets (200 mg.) three times daily for three days (total 18 tablets).

Doses are similar for adults and children above the age of 2 years. However, for children, the liquid preparation is preferred to tablets. One tablet is equivalent to 1 teaspoonful of liquid preparation.

It does not require any preparation such as prior starving or follow-up purgation.

What are its side-effects?

Mebendazole is a safe drug. Rarely, it causes abdominal pain, diarrhoea and rash.

What precautions should be taken?

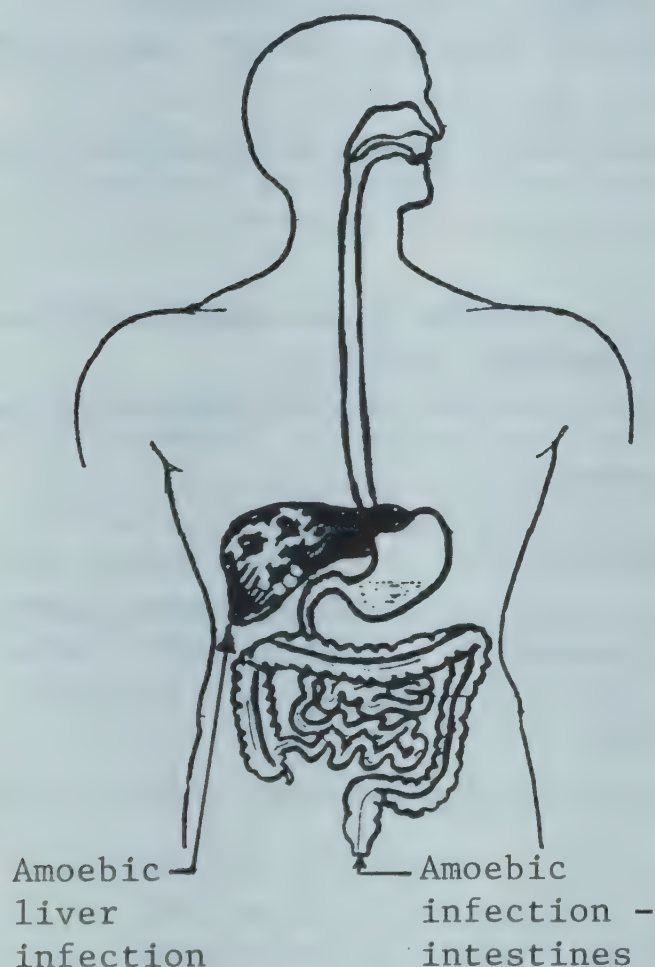
These are similar to those described under piperazine. The drug should be avoided in children below 2 years and in pregnant women.

Mebendazole is more expensive than piperazine. Hence, it should be used in those cases where piperazine is not useful.

17. METRONIDAZOLE

How does it help?

Metronidazole kills intestinal parasites called amoebae and giardia which cause diarrhoea and abdominal pain; amoebae sometimes damage the liver and cause liver abscess. They also kill other parasites called trichomonas which cause infection of the vagina and certain bacteria that infect wounds.



When should it be used?

1. In amoebic dysentery, where the patient complains of pain in the abdomen, gases and loose stools. The stools may be blood stained and/or slimy.
2. In amoebic infection of the liver - where the patient complains of a feeling of weakness, abdominal pain, particularly in the right upper quadrant, gases and loss of appetite. History may reveal previous attacks of diarrhoea with blood and slimy material in the stool. Such a patient should be referred to the doctor.
3. In women with vaginal infection characterized by profuse vaginal discharge. The discharge is bad-odorous, frothy and yellowish-white in colour. The patient may complain of local itching and a burning sensation.
4. In infected wounds with foul-smelling pus, where it can be combined with oral penicillin or sulphadimidine.

How is it supplied and given to patients?

It is given orally. It is supplied as tablets containing 200 mg. or 400 mg. of metronidazole.

The liquid preparation contains 100 mg. per 5 ml. (one teaspoonful) of the drug, for use in children.

DOSE

Description	Dose Per Adult
Amoebic dysentery	Give two tablets of 400 mg. each thrice daily for five days.
Vaginal infection	Give one tablet of 400 mg. twice daily for 7 days or a single dose of 5 tablets.
Infected wounds	Give one tablet of 400 mg. thrice daily for 7 days.

DOSE

Patient's Age (Years)	Dose for amoebic dysentery		
1 - 2	100 mg. (1 teaspoonful))	All the doses are given three times daily for 5 days.
2 - 3	200 mg. (2 teaspoonsful))	
4 - 7	300 mg. (3 teaspoonsful))	
8 - 12	400 mg. (1 tablet))	
)	

What are its side-effects?

It has a bitter taste and causes gastric upset, nausea and, rarely, vomiting. It may cause headache and a metallic taste in the mouth. Usually these are mild.

What precautions should be taken?

1. Inform the patient that it may cause mild gastric upset - but not to worry about.
2. Do not give the tablet on an empty stomach.
3. If the given dose is not tolerated, give a smaller dose during day-time and a large dose at bedtime.
4. Advise the patient not to drink alcohol while on this drug.
5. In cases of vaginal infection, treat also the male partner. In such cases sexual intercourse should be avoided until the discharge has stopped completely.

18. ORAL REHYDRATION SALTS (ORALYTE, ORS)

How does it help?

A person who passes frequent watery stools loses a large amount of water and salts from the body. Sudden loss of water and salt (dehydration) causes marked weakness, thirst and sunken eyeballs. Severe diarrhoea causes decreased urine output, increased pulse rate and unconsciousness resulting in death. It is estimated that about one out of every 10 children born in developing countries dies of diarrhoea before reaching the age of 5. Oral rehydration salts (ORS) contain sugar and mineral salts needed by the body. When taken dissolved in water, they promptly replace the water and salts lost during diarrhoea and correct dehydration.

When should it be used?

Oral rehydration salts (ORS) are specifically intended for the replacement of water and salts lost in acute diarrhoea. It is vital that these losses are rectified as rapidly as possible, particularly in infants and young children.

How is it supplied and given to patients?

Packets are recommended, each containing:

<u>ORS - bicarbonate</u>		<u>ORS - citrate</u>	
Sodium chloride	3.5 g.	Sodium chloride	3.5 g.
Sodium bicarbonate	2.5 g.	Trisodium citrate, dihydrate	2.9 g.
Potassium chloride	1.5 g.	Potassium chloride	1.5 g.
Glucose	20.0 g.	Glucose	20.0 g.

Dissolve, immediately before use, one packet in one litre of clean, boiled cooled water, or, because the sizes of packets vary, in the quantity of water indicated on the packet. If a litre measure is not available, use a glass. Average medium size glass has about 180-200 ml. capacity. Sometimes soft drink bottles (for example, Coca Cola or milk bottles) with known capacity may be available. The volume of fluid required and the rate at which it should be given depend upon:

- the weight (age) of the child.
- the initial degree of dehydration.
- the rate of fluid loss as long as the diarrhoea persists.

Initial Treatment

The degree of dehydration is determined from the general appearance

of the child and the following signs:

General appearance and condition of infant or child	Mild Dehydration*	Moderate Dehydration	Severe Dehydration
General condition	Thirsty, restless	Thirsty, restless or lethargic irritable when aroused	Drowsy <u>or</u> comatose, limp, cold, sweaty, bluish hands, feet
Respiration	Normal	Deep	Deep and rapid
Pulse	Normal	Rapid, weak	Rapid <u>and</u> weak <u>or</u> undetectable
Fontanelle, Eyes	Normal	Sunken	<u>Very</u> sunken
Skin	Pinch retracts immediately	Pinch retracts slowly	Pinch retracts <u>very</u> slowly (2 sec.)
Mucous membranes	Moist	Dry	<u>Very</u> dry
Urine flow	Normal	Reduced and dark	None

*Home treatment advised. Refer to general guidelines for treatment of diarrhoea, page 77.

Degree of Dehydration	Amount of Fluid needed ml./kg.	Approximate total fluid deficit (ml.)				
		1-4 months	5-8 months	9-12 months	1-2 years	2-4 years
Moderate	100	200-400	400-600	600-800	1000	1200
Severe	Intravenous fluid replacement needed					

The maximum rate of fluid replacement for small children is about 300 ml. per hour.

When intravenous infusion is not possible an attempt can be made to administer ORS by mouth using a dropper at a rate of about 20 ml./kg. body weight an hour.

Replacement of continued fluid loss

After initial rehydration the child should be given:

- ORS in a volume that matches the fluid loss in the stools,
- Plus the normal fluid intake, either as breast feeds or as a supplement of equal volumes of milk and clean water.

Up to one third of the total fluid intake can be given as equal volumes of milk and clean water.

Additional measures

The child should be offered its normal food as soon as possible. Infants over 4 months should be started on semi-solid foods. Fruit juices, bananas or coconut-water are particularly useful in repairing losses of potassium.

1. If the preformulated ORS packets as above are not available, ORS solution can also be prepared from home ingredients mentioned above - common salt, baking soda and sugar. Instead of glucose, use sucrose (common table sugar) or even crude sugar called gur or jaggery. 40 g. of table sugar (about 8 teaspoons) is equivalent to 20 g. (4 teaspoonsful) of glucose. Mix 8 teaspoonsful of sugar with approximately 1 teaspoonful of salt and 1 teaspoonful of baking soda together with 1 litre of boiled and cooled water or clean drinking water. Give to child as indicated for packaged ORS.

As potassium chloride is not usually available, give the child any one of the following every 24 hours:

- 2 large-size bananas (mashed)
- 3 small-size bananas (mashed)
- 3 cups of coconut water
- 2 cups of orange juice
- 2 cups of mashed papaya or
- 5 medium-size ripe tomatoes

Gur, the crude sugar, also contains varying amounts of potassium.

2. If the above things are not available, prepare the solution with ordinary salt and sugar. For this take salt in a teaspoon. Level it with a knife or a flat object. Add one level-spoonful of salt to one litre of water and mix. Taste the mixture. If it tastes more salty than tears, pour away and make it again with less salt. Finally add 8 level-teaspoonsfuls of sugar and mix it well. Even rice water can be used in place of sugar.

Levelling of spoon



3. For making the solution, boiled water is preferable, if available. If not, use clean drinking water.
4. Give instructions to the relatives regarding the preparation and administration of ORS solution. (refer page 78)

What are its side-effects?

Used properly, it is quite safe.

What precautions should be taken?

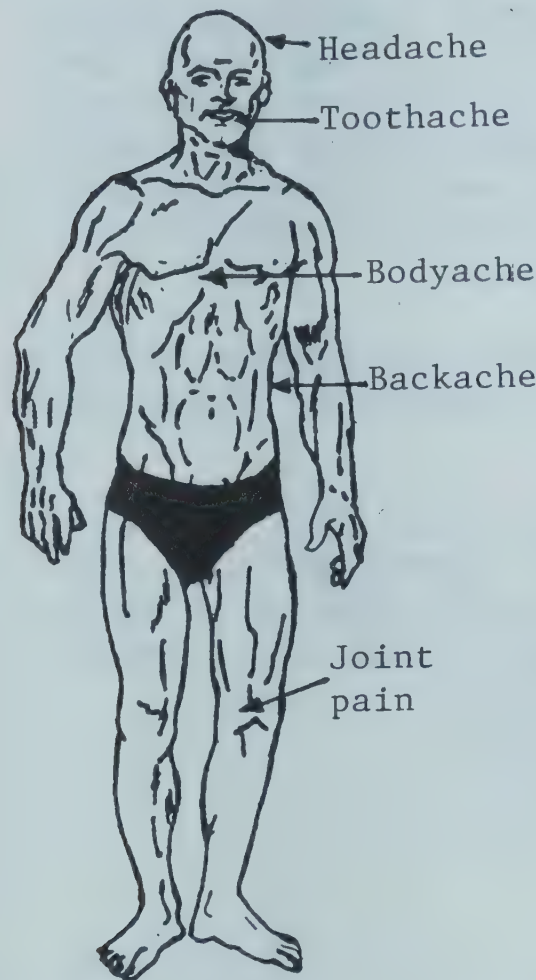
1. The solution should be prepared fresh every day using a clean utensil and spoons and after washing the hands thoroughly. It should be kept covered in a cool place.

2. During ORS administration, measure the amount of urine passed. A patient who has received adequate amounts of ORS will pass the normal (usual) amount of urine daily. Failure to increase urine output suggests a need for administering more ORS. Continue ORS therapy till the diarrhoea stops or the patient is referred to the doctor.
3. If ORS packets are stored at high temperature (more than 30°C) and high humidity for a long time, the product is likely to cake. If you have a limited supply of ORS, do not throw away ORS that has become caked. It can still be used provided it dissolves completely in water. If the ORS has turned to a brown colour it should not be used.
4. All cases of moderate or severe dehydration should be started on ORS fluid as mentioned above and referred to the doctor.
5. Educate the families and encourage them to begin giving ORS - either complete formula or sugar and salt - on their own initiative as soon as a child develops diarrhoea, rather than waiting for a health worker. The same is true for adults.

19. PARACETAMOL

How does it help?

Like aspirin, Paracetamol relieves pain such as bodyache, headache, muscle pain and joint pain. It also lowers fever without correcting the cause, but it is not useful in rheumatic fever or in pain asso-



ciated with swelling. It has an advantage over aspirin in that it does not cause nausea or stomach pain or increase the stomach acid (hyperacidity). It can be given safely in people who cannot tolerate aspirin. It can also be given in liquid form to children.

It is not useful in colicky abdominal pain.

When should it be used?

Like aspirin it can be used:

- 1. to relieve pain
- 2. to relieve fever
- 3. to relieve symptoms of common cold and influenza

How is it supplied and given to patients?

It is supplied as tablets containing 500 mg. of Paracetamol and as a syrup containing 125 mg. of the drug per 5 ml. (one teaspoonful).

It is used orally, taken along with plenty of water. It can be taken on an empty stomach. Liquid preparation should be used for children.

DOSE

Patient's Age		Dose	
2 - 6 months	50 - 100 mg.)	4 times a day, if required
½ - 1 year	60 - 120 mg.)	
1 - 6 years	120 - 250 mg.)	
6 - 12 years	250 - 500 mg.)	
Adults	Give 1-2 tablets repeated after 6 hours, if needed.		

What are its side-effects?

It is better tolerated than aspirin and hence preferred for relieving pain and fever. Rarely, it causes skin rash. Swallowing very large doses - 20 tablets - at a time can damage the liver.

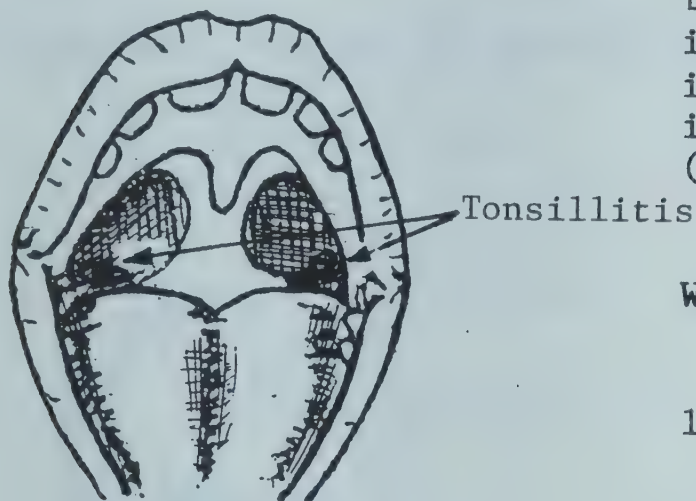
What precautions should be taken?

Keep tablets and syrup away from children. Do not use the drug for more than 7 days at a time.

20. PENICILLIN

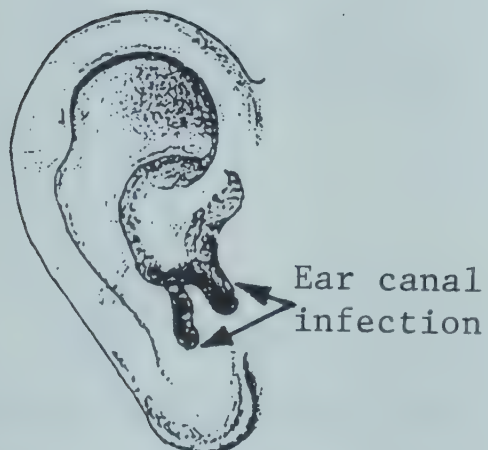
How does it help?

This is an antibiotic which kills certain types of bacteria and cures diseases caused by them. It does not act against (i) most bacteria that cause urinary-tract infection or diarrhoea, (ii) virus infections such as common cold, influenza and chickenpox, or (iii) tuberculosis and leprosy.

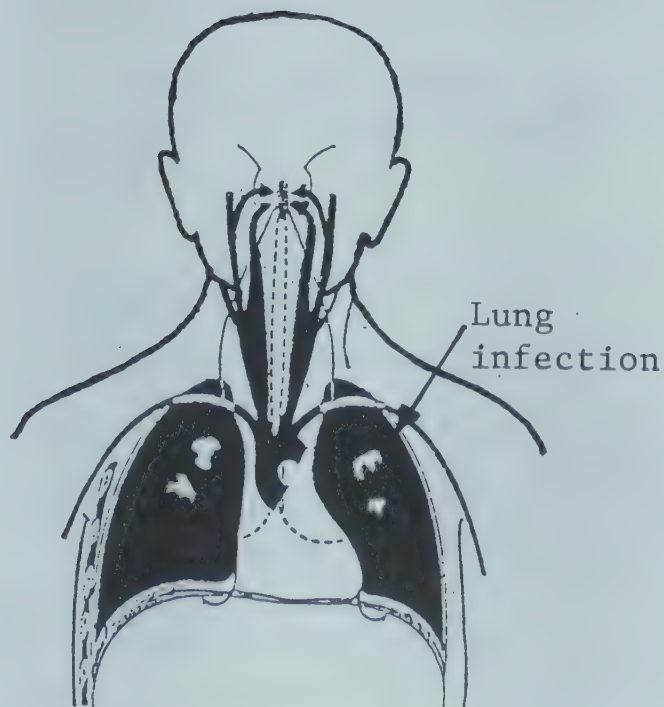


When should it be used?

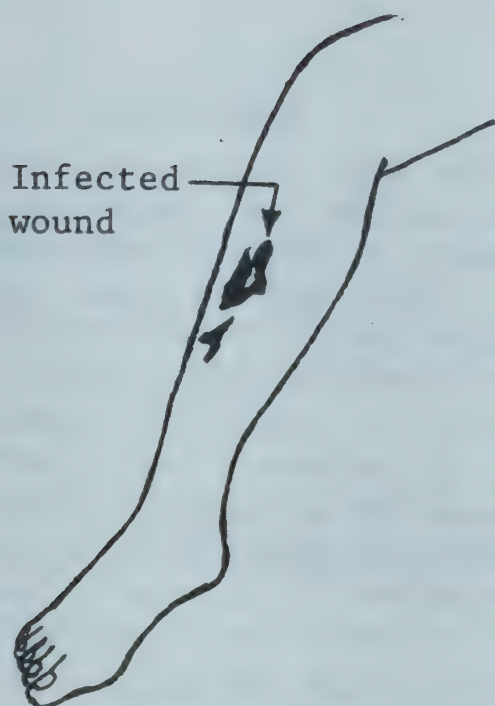
1. In tonsillitis with fever. Ask the patient to open his mouth. You will find that his throat is red and that two glands at the end of the tongue called tonsils are swollen and red, inflamed. They may have small whitish/greyish spots on the surface. In children diphtheria should be excluded.



2. In acute ear infections associated with purulent discharge for less than 14 days. In these conditions injectable penicillin is to be preferred to oral penicillin.



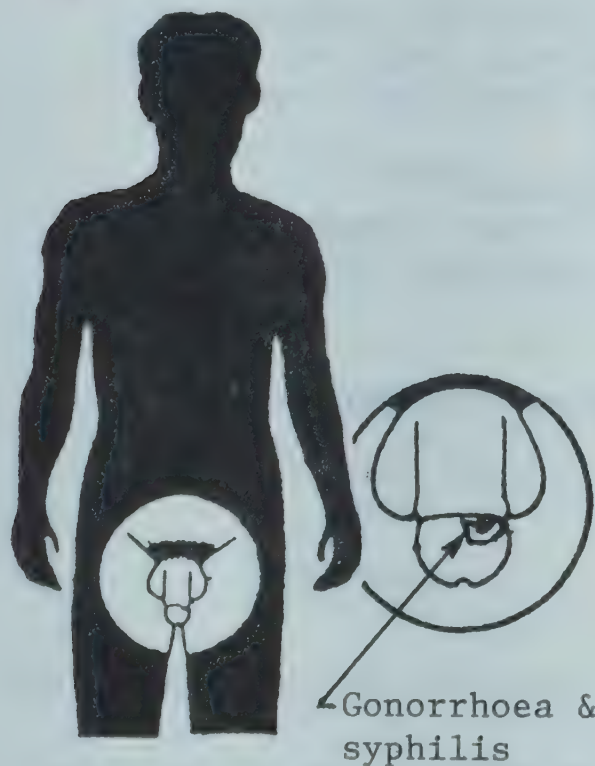
3. In acute lung infections such as pneumonia, bronchopneumonia and other lung infections with yellowish sputum. In pneumonia and bronchopneumonia, the patient will have fever, cough and chest pain. He brings out sputum which may have a reddish, brown colour because of blood contamination. The patient looks ill. Penicillin should be started immediately and the patient should be referred to the doctor.



- 4. In infected wounds and open fractures. Such cases should be referred to the doctor.
- 5. To treat skin infections associated with pus (not scabies, unless infected).
- 6. In sexually-transmitted diseases such as syphilis and gonorrhoea. In these two conditions, penicillin is to be administered by injection only. Refer to the doctor.

How is it supplied and given to patients?

For oral use, it is supplied as penicillin V (phenoxymethyl penicillin) tablets containing 125 mg. or 250 mg. of the drug. Liquid preparation for use in children is to be prepared freshly with diluent supplied with the drug; the final concentration of liquid is 125 mg. of penicillin V per 5 ml. (1 teaspoonful). The prepared liquid should not be used after 5 days since it deteriorates. It should be stored in a cool place.



Procaine penicillin and benzathine penicillin are given by intramuscular injection.

DOSE: For adults suffering from mild throat and acute respiratory infections, give 2 tablets (500 mg.) every 6 hours (total 8 tablets per day).

DOSE

Patient's Age (Years)	Dose
Up to 6	Give 1 teaspoonful of syrup (125 mg.) every 6 hours
6 - 12	Give 2 tablets of 125 mg. each (250 mg.) every 6 hours (total 8 tablets of 125 mg. each per day)

Treatment is usually given for 7 days or till three days after the symptoms disappear.

What are its side-effects?

Oral penicillin is a safe drug. Rarely, it may result in mild allergic reactions such as skin rash. Injection of penicillin, however, may occasionally cause severe allergic reaction. The blood pressure falls, the patient becomes pale and cold and he goes into shock within a short time after the injection.

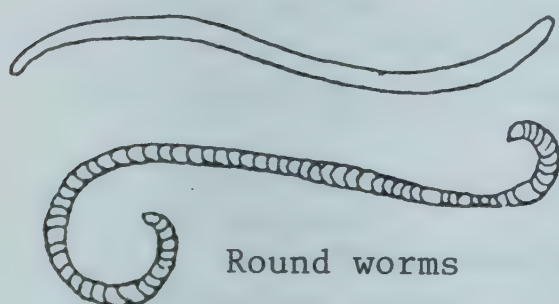
What precautions should be taken?

1. Always ask if a patient has a history of allergy to penicillin. Do not give penicillin if the patient is known to be allergic to it.
2. If the patient develops any reactions, such as skin rash following penicillin, it should be stopped and not repeated. Warn the patient not to take penicillin in any form again or give him a warning card stating this for reference.
3. Do not use oral penicillin to treat common cold. Most respiratory infections are mild and do not need an antibiotic.
4. Do not use penicillin locally as an ointment.

21. PIPERAZINE

How does it help?

Piperazine acts against two types of worm, namely, roundworm and pinworm (or threadworm), which infest the intestinal tract. A large number of people in developing countries suffer from these infestations. The presence of these worms in the intestines gives rise to vague abdominal pain, loss of appetite, nausea, failure to gain weight, sometimes diarrhoea, and allergic reactions such as itching and coughing. Piperazine paralyses both roundworms and pinworms, which are then expelled through the stools.



Round worms



Pinworms

When should it be used?

1. It is mainly used in the treatment of roundworms. Common roundworms are pinkish, glistening white in colour, about 0.3-0.5 cm. thick and 15-20 cm. long.
2. It is also used to remove pin (thread) worms from the intestine (refer to Section on Mebendazole, page 29).

How is it supplied and given to patients?

Piperazine is used as phosphate or citrate salt.

100 mg. piperazine hydrate = 125 mg. piperazine citrate =
104 mg. piperazine phosphate.

It is given orally as tablets containing the equivalent of piperazine hydrate 500 mg. Piperazine hydrate (as citrate) is also given in syrup form to children. The syrup contains 750 mg./5 ml. (one teaspoonful) of piperazine hydrate (as citrate).

Dose for roundworms

In adults, a single dose equivalent to 4 g. of piperazine hydrate (8 tablets) is administered, preferably in the evening, followed by 2 senna tablets at bedtime to facilitate the expulsion of worms. Preliminary fasting is not necessary. Administration of senna is advisable if there is accompanying constipation.

In children, piperazine hydrate (as citrate) is given in the dose of 120 mg./kg. up to a maximum of 4 g. as a single dose, as syrup.

Dose for Pinworms

Patient's Age (Years)	Dose
Up to 2	$\frac{1}{2}$ teaspoonful or 50 mg. per kg. bodyweight
2 - 4	1 teaspoonful
5 -12	2 teaspoonsful
Over 12	2 g. (4 tablets)

The above doses are given daily for 7 days.

What are its side-effects?

Rarely, it causes gastric upset, nausea and giddiness.

What precautions should be taken?

Do not exceed the dosage or duration of treatment.

Instructions to patients:

1. Instruct the patients to wash hands and finger nails thoroughly before each meal and after each visit to the toilet. Nails should be cut regularly.
2. In case of pinworm, all members of the family require treatment.
3. Patients should be informed that worm infestation occurs on account of unhygienic conditions, by eating raw vegetables and salads without washing them, by consuming contaminated water or food, and by playing or walking barefoot on grounds contaminated by stools.

22. POVIDONE-IODINE

How does it help?

Povidone-iodine is an organic complex of iodine which releases elemental iodine and acts against many bacteria as well as certain fungi. Like tincture iodine, it is an antiseptic. However, it does not irritate the skin or stain the skin. Further, it is quite stable.

When should it be used?

It can be used for -

1. Hand washes, mouth washes and gargling
2. Cleansing of the skin prior to surgery
3. Treating minor abrasions, wounds, burns and skin infections
4. Treating trichomoniasis - an organism causing foul-smelling, frothy white, vaginal discharge (leucorrhoea)
5. Treating ringworm

How is it supplied and given to patients?

It is available as 15 per cent povidone-iodine (stock solution), to be used only after dilution, for use on mucous membranes. For cleaning the skin, it can be used directly without dilution. For handwashes and mouth washes, 1 per cent solution is used. For this purpose dilute one part of stock solution with 14 parts of water.

It is also available as an ointment containing 5 per cent povidone-iodine for application to skin infections, such as boils, impetigo, mild burns and infected ulcers. For the treatment of burns, a 5 per cent solution or ointment may be used. For treating vaginal infections, application of 5 per cent solution of povidone-iodine twice daily in the form of a douche for 2 weeks is recommended. Alternatively, povidone-iodine vaginal tablet (200 mg) may be used twice daily for two weeks. For this purpose the tablet is moistened with water before being inserted into the vagina.

What are its side-effects?

Patients sensitive to iodine may show allergic reactions, although this is rare. Povidone-iodine should be avoided in pregnancy.

What precautions should be taken?

1. Do not use it in patients with a history of iodine allergy.
2. Do not use in cases of extensive burns.
3. Povidone-iodine and chlorhexidine are used for similar purposes. Hence, the cost of preparation should be taken into account while making a choice.

23. PRIMAQUINE

How does it help?

Primaquine is an antimalarial drug which kills the parasites present in the liver cells. It is not useful for treating an acute attack, but is administered along with chloroquine for the complete cure of certain types of malaria. Further, it also used to interrupt transmission of malaria by mosquitoes.

When should it be used?

1. It is used to treat patients with confirmed benign malaria who get repeated attacks of the disease after visiting known malarious places. In such cases, chloroquine should be given first, followed by primaquine for 14 days to produce radical cure.
2. In areas where falciparum (malignant) malaria is known to occur, a single dose of 30 mg. of primaquine after chloroquine prevents the transmission of the disease.

How is it supplied and given to patients?

It is available as primaquine phosphate tablets each containing 7.5 mg. of primaquine base. For the radical cure of malaria, give 15 mg. of primaquine (2 tablets) along with chloroquine for 14 days. If the patient is unable to tolerate 15 mg. of primaquine daily, then six tablets once a week (45 mg. base) for 4-8 weeks may be given.

For preventing the transmission of malaria, primaquine is administered in a single dose of 30 mg. following the dose of chloroquine.

What are its side-effects?

At the above dosages, primaquine is well tolerated. However, in some people with a deficiency of certain blood-cell enzymes, it may cause destruction of red blood cells and anaemia. Rarely, it may lead to gastric upset, vomiting and jaundice.

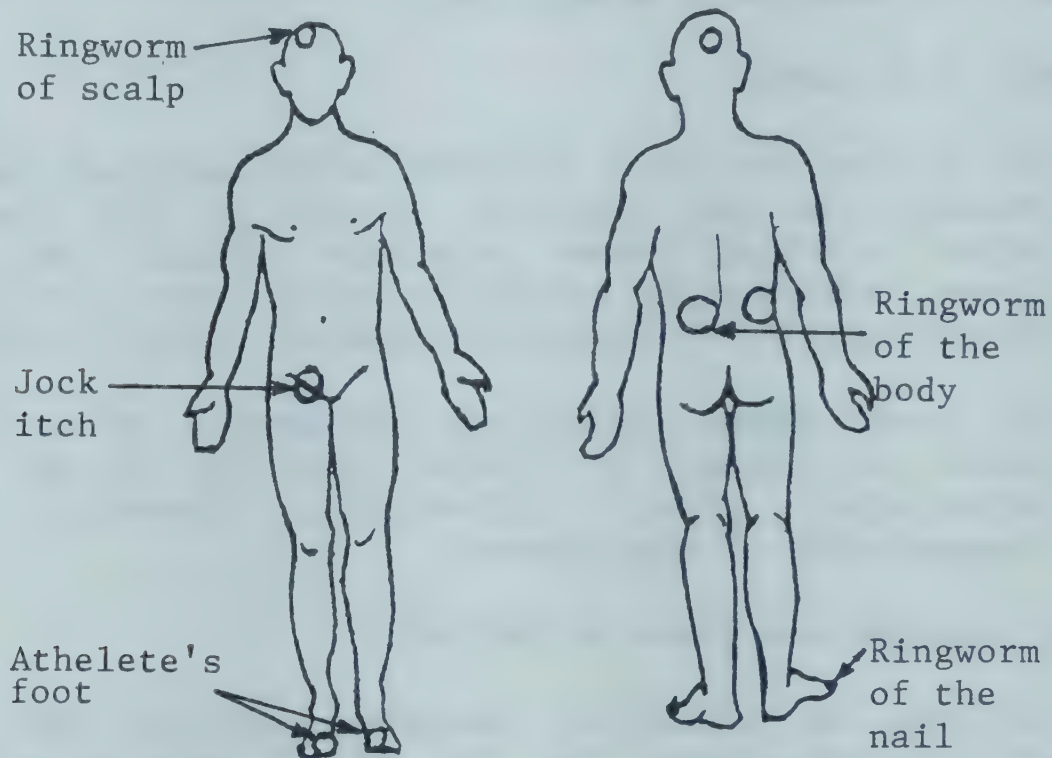
What precautions should be taken?

1. Do not exceed the prescribed dosages.
2. Watch for the development of jaundice (eyes and urine become yellow) and stop the drug immediately.
3. The drug should be avoided in early pregnancy.
4. Do not give sulphadimidine or co-trimoxazole to patients who are taking primaquine tablets.

24. RINGWORM OINTMENT (Whitfield's Ointment)

How does it help?

This ointment is used to treat fungal infections of the skin. Whitfield's ointment contains benzoic acid 6 per cent and salicylic acid 3 per cent. Certain fungi attack the hair on the head, the nails and the superficial part of the skin. Fungal infection of the



hair causes localized redness, itching, discharge of fluid, and flakes formation. Finally, hair is lost in patches. Fungal infection of the body produces typical ring-like (circular or annular) patches, hence the name ringworm. The border of such patches is raised, reddish in colour as compared to the central portion, and there is itching. There may be oozing of fluid. The rings go on increasing and may reach a diameter of 10 cm. or more. These patches can occur on any part of the body, but are common in moist areas such as armpits, waist, under the breast, groin, buttocks and the back. Any growing lesion which looks reddish, with a definite raised border, scaling and marked itching suggests fungal infection. Fungus also attacks the spaces between the toes of the foot. These spaces get sodden and cause itching. Itching is worse when the affected foot comes in contact with water. It may extend also to the sole of the foot. Small blisters may be formed which may later get infected.

When should it be used?

It is used to treat ringworm of the body. When applied locally and adequately, it cures the infection. It is partially effective in fungal infection of the toes. It does not cure fungal infection of the hair or nails. Such cases should be referred to the doctor.

How is it supplied and given to patients?

It is supplied as an ointment containing benzoic acid and salicylic acid in vaseline base.

It is applied on the patches with gentle rubbing, twice daily for four weeks. Older patches need longer treatment. It is advisable to apply the ointment after cleaning the area with soap and hot water and making it dry.

What are its side-effects?

Rarely, it may cause mild irritation and allergic reaction. This is not troublesome.

What precautions should be taken?

Do not allow the ointment to come in contact with the eyes.

Instructions to patient:

1. Fungal infections are transmitted through direct contact, infected clothes and infected combs. Hence, the patient's clothes should be properly washed and dried in hot sun.
2. Like scabies, ringworm infection is a disease caused by unclean habits. People should be taught cleanliness and personal hygiene, in order to prevent fungal infections.

25. SENNA

How does it help?

Senna is prepared from the pods or leaves of a plant. It contains sennosides which act on the colon and increase the motility. It also decreases absorption of water from the faecal matter. The drug therefore produces a single thorough evacuation of bowel.

When should it be used?

It is used occasionally to treat constipation. In old people, it may be necessary to use laxatives more often. In such cases, Ispaghula may be preferred (refer to page 26).

How is it supplied and given to patients?

It is supplied as a tablet containing 7.5 mg. sennosides. It is also available as dried leaves or pods. A tablet is taken with plenty of water. An infusion is prepared by soaking 4-8 pods in about 150 ml. (a cup) of hot water for about 12 hours. A tablet or an infusion is usually taken at bedtime. It causes evacuation next morning.

DOSE: For adults, give 2-3 tablets or 150 ml. infusion at bedtime.

For children, 1 tablet or 50-75 ml. infusion (half a cup) at bedtime.

What are its side-effects?

Mild griping pain may occur. The faeces and urine may become yellow to red coloured.

What precautions should be taken?

1. Do not give senna to a patient who develops sudden constipation, associated with abdominal pain, vomiting and tightness of abdominal muscles. Such cases should be referred to the doctor.
2. Do not give it to a child below the age of three years.
3. Do not use it repeatedly to treat chronic constipation.
4. Avoid giving senna to lactating mothers, as it may cause diarrhoea in breast-fed infants.
5. Avoid it in patients with fever.

26. SODIUM BICARBONATE (Baking Soda)

How does it help?

Sodium bicarbonate when taken with water comes in contact with the acid in the stomach and neutralizes it (antacid). During this process, carbon dioxide is liberated and is expelled as gas, giving relief from abdominal discomfort. Sodium bicarbonate has an action similar to aluminium hydroxide or magnesium trisilicate, but it is quick-acting.

When should it be used?

1. It is useful for relieving abdominal discomfort and a feeling of bloating after taking of food.
2. It can be used to relieve stomach ulcer pain.
3. It relieves the burning sensation behind the breast-bone (heartburn) occurring after food or while lying down.

How is it supplied and given to patients?

It is supplied as tablets containing 500 mg. of sodium bicarbonate; it can also be given as powder. The usual dose is 2 tablets (1 g.) given as a single dose along with water. It gives rapid relief from abdominal discomfort and heartburn.

What are its side-effects?

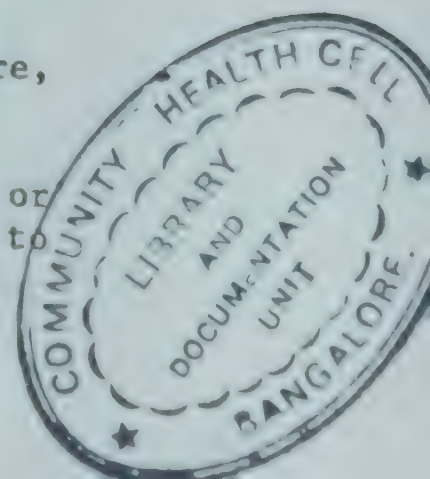
Sodium bicarbonate is absorbed in the blood. However, a single dose produces no problem, but repeated administration of large doses should be avoided.

What precautions should be taken?

1. If the abdominal pain persists or occurs repeatedly, the patient should be referred to the doctor.
2. Do not use it in patients with high blood pressure, or heart disease or in whom urine output is less.
3. Do not use it repeatedly, particularly in infants or young children; if the symptom persists, refer to the doctor.

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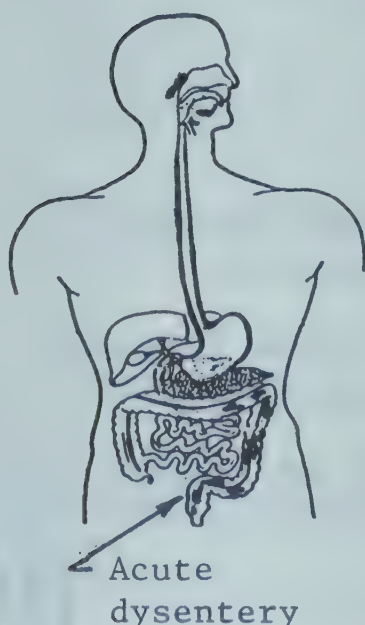
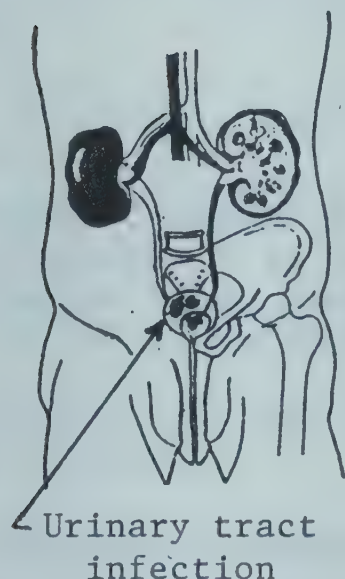
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27. SULPHADIMIDINE

How does it help?

This drug is useful in certain bacterial infections. It is particularly useful in urinary-tract infections and in diarrhoea associated with fever; in these conditions penicillin is not useful. Sulphadimidine is not useful in common cold or influenza, typhoid, tuberculosis or leprosy.



When should it be used?

1. In tonsillitis with fever: Look at the tonsils and throat for redness. The tonsils may show white spots. The patient usually has fever, pain in the throat and cough. However, penicillin is the drug of choice.
2. In acute lung infections characterized by fever, cough and yellow sputum. Penicillin or co-trimoxazole is the drug of choice.
3. In urinary-tract infection, where the patient complains of pain in the loin, fever and burning while passing urine.
4. In dysentery characterized by fever, frequent liquid stools and pain in abdomen. The stools may contain blood or mucus.
5. In skin infections such as boils and in scabies complicated by pus formation (not to be used locally).

How is it supplied and given to patients?

It is supplied as tablets containing 0.5 g. of sulphadimidine and is used orally.

Suspension containing 500 mg. per 5 ml. (1 teaspoonful) is available for use in children.

DOSE

Patient's Age (Years)	Dose
$\frac{1}{2}$ - 1	Half-teaspoonful initially, followed by $\frac{1}{4}$ tea- spoonful every 8 hours.
1 - 5	1 teaspoonful initially, followed by $\frac{1}{2}$ teaspoonful every 8 hours.
6 - 12	2 teaspoonsful initially, followed by 1 teaspoonful every 8 hours.
Adults	Give 4 tablets followed by 2 tablets every 8 hours.

If the child can be weighed, give the dose of 150 mg. per kg. per day, divided into four parts, every 6 hours.

The drug is usually given for 7 days except in urinary-tract infection, where it is given for 10-14 days.

What are its side-effects?

1. It causes stomach upset and nausea and, rarely, vomiting.
2. Skin rash, fever and joint pain.
3. Used for a longer time, it may rarely cause liver damage and may decrease blood cells.

What precautions should be taken?

1. Do not use it if the patient gives previous history of rash and fever following this type of tablet.

2. Ensure adequate urine output before starting by advising plenty of water for drinking.
3. Stop the drug if skin rash, pain in joints or ulcers in the mouth are noticed. Warn the patient not to use this drug again. Give him a warning card.
4. Do not continue the drug beyond the recommended period. If the patient does not respond within 5 days, refer him to the doctor.
5. Do not use it for local application on the skin.

28. TETRACYCLINE EYE OINTMENT

How does it help?

Tetracycline is an antibiotic. It acts against many types of bacteria and also against the organism that causes an eye disease called trachoma. For this purpose, it is used locally, as eye-drops or eye ointment.

When should it be used?

It is used to treat acute eye infections, such as sore eyes (conjunctivitis) associated with discharge and pain.

It is also used to treat trachoma (see section on Eye Problems, page 93).

How is it supplied and given to patients?

It is supplied as tetracycline hydrochloride 1 per cent eye-drops and tetracycline hydrochloride 1 per cent eye ointment.

For using eye-drops, make the patient lie down or sit with the neck bent backwards. Lift the upper eyelid and instil 1 or 2 drops and close the eye for a minute. Since the effect of the eye-drops lasts only for a short time, they should be instilled frequently, preferably every hour, for the first day in acute infections.

Retract the lower lid and instil tetracycline eye ointment. It produces a prolonged effect and hence it is applied less frequently, 3-4 times during daytime and once at bedtime. The ointment also helps to soften crusts which cause the lids and eyelashes to adhere together when the patient is asleep.

For duration of treatment, see section on Eye Problems.

What are its side-effects?

It is quite safe. Rarely, it may give rise to local skin rash.

What precautions should be taken?

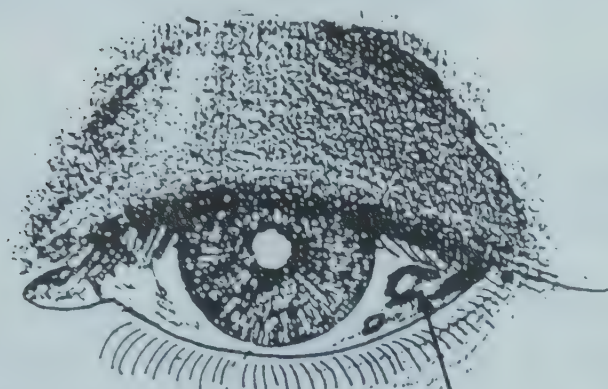
1. Before applying the ointment or drops, wash your hands with soap and water.
2. Do not apply the ointment to the skin.
3. Store the ointment and the drops in a cool place.

29. VITAMIN A

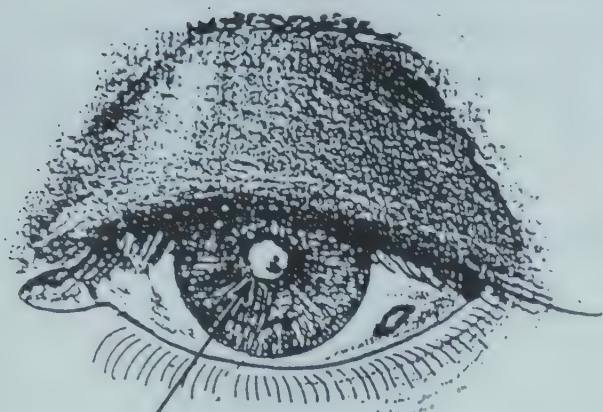
How does it help?

Vitamin A (Retinol) is naturally present in milk, eggs and liver, in vegetables such as carrots, sweet potato and amaranth (spinach) and fruits such as papaya and mango. It is essential for growth, a normal skin texture and night vision. Deficiency of vitamin A is one of the major causes of blindness in developing countries; it is usually associated with malnourishment. Such type of blindness is prevented by the administration of vitamin A.

When should it be used?



Dry eye whitish
grey spot



Dry cornea with
little pits

1. It is used to treat vitamin A deficiency. In the initial stages, the patient cannot see in the dark. A child cannot see the mother in a darkened room. The eyes become dry and sometimes small, whitish, foamy spots appear on the white surface of the eye-ball. If this condition is not treated, small ulcers are formed which can get infected, leading to local destruction, scarring and blindness. Likewise, the skin also becomes dry and scaly. Children with vitamin A deficiency also suffer from diarrhoea. Except the ulceration all other changes will be readily reversed by the administration of vitamin A.

2. Prophylactic use of vitamin A in undernourished children prevents damage to the eyes and blindness.

How is it supplied and given to patients?

It is supplied as capsules and pearls containing 25 000 IU and 200 000 IU of vitamin A (Retinol palmitate). Vitamin A drops containing 50 000 IU per ml. may be used in children.

Fish liver oil such as shark liver oil or cod liver oil contains both vitamin A and vitamin D.

For the treatment of vitamin A deficiency in children, give one capsule containing 200 000 IU or an oily solution containing an equivalent amount of vitamin A and refer the patient urgently to the doctor.

For the prevention of vitamin A deficiency in undernourished children above 1 year of age, give one capsule 200 000 IU every 6 months. Undernourished mothers may be given 20 000 IU once a week during pregnancy and lactation. However, advise the patients regarding diet, particularly with regard to green, leafy vegetables, carrots and papaya. Newborns may be given 100 000 IU vitamin A at birth.

What are its side-effects?

The doses recommended are safe. Repeated large doses of vitamin A may cause loss of appetite, dry, itchy skin and loss of weight.

What precautions should be taken?

1. Do not exceed the dosages recommended.
2. Do not use large doses during pregnancy.
3. Keep the vitamin capsules out of reach of children.
4. Educate the people about the preventive aspect of blindness due to vitamin A deficiency and advise them about the diet. Mothers should be encouraged to breastfeed their children.

30. VITAMIN B COMPLEX

How does it help?

Vitamin B complex is naturally present in whole cereals, unpolished rice, beans, groundnuts, leafy green vegetables, milk and yeast. Its deficiency occurs as a part of general nutritional deficiency. Patients with B complex deficiency complain of lack of energy, burning and tingling in the limbs, pain in the legs, and sore tongue. The lips and tongue become red and the lips show cracking, particularly at the angles of the mouth. In addition, deficiency may also cause diarrhoea and skin changes.

The skin eruptions are associated with an itching and burning sensation, which become worse on exposure to sun. Later the skin becomes thick, pigmented and rough and assumes a brown-black colour.

Severe vitamin B complex deficiency causes marked weakness, difficulty in walking, mental changes and swelling of the body. Death may occur due to heart failure.

Administration of vitamin B complex promptly corrects the deficiency, relieves the symptoms and reverses the changes caused by it. It also prevents such changes in patients who are undernourished and are likely to develop them.

When should it be used?

1. It is used to treat vitamin B complex deficiency.
2. It is used to prevent vitamin B complex deficiency.

How is it supplied and given to patients?

Vitamin B is supplied as tablets or syrup for oral use.

Vitamin B complex tablets for preventing the deficiency usually contain thiamine 1-2 mg., riboflavin 1-2 mg., nicotinamide 15-20 mg. and pyridoxine 1-2 mg. One tablet or an equivalent amount of syrup is given daily. If this is not available, 8-10 yeast tablets are given per day.

In case deficiency develops, larger doses are required. Refer such patients to the doctor.

What are its side-effects?

In the doses mentioned above, vitamin B complex does not produce any side-effects.

What precautions should be taken?

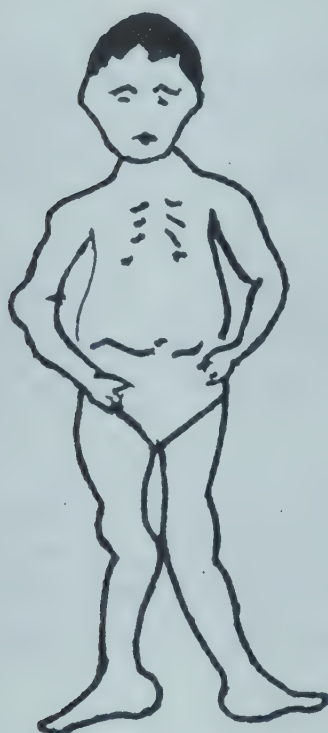
Protect the tablets or syrup from sunlight and store in a cool place.

31. VITAMIN D

How does it help?

Vitamin D is naturally produced from a substance present in the human skin following exposure to sunlight. It is also present in fish liver. Deficiency of vitamin D causes rickets in children; children become lethargic, do not take interest in play, and would prefer to sit idle. Older children may complain of muscle pain.

Owing to vitamin D deficiency, the bones are not properly formed and may get easily deformed. In toddlers the leg bones get curved like a bow. The front portion of the skull may get enlarged giving rise to frontal bossing. In severe cases, the child may develop convulsions. Administration of vitamin D cures rickets and promotes normal growth of the bones.



Rickety Child

Deficiency of vitamin D in elderly persons causes muscle and bone pain. Patients complain of muscle cramps and decreased muscle strength. Bones become fragile and may fracture.

When should it be used?

1. To prevent and treat rickets in children.
2. During pregnancy.

How is it supplied and given to patients?

1. Tablet calciferol containing 10 000 units of Vitamin D.
2. Calciferol solution containing 3 000 units per ml.
3. Vitamin A and D capsules contain 4 000 units of vitamin A and 400 units of vitamin D.

For the prevention of rickets in children, give 400 units of calciferol daily. For the treatment of rickets, refer to the doctor.

What are its side-effects?

Large doses of vitamin D will cause nausea, vomiting, loss of appetite and constipation. The patient may pass a large amount of urine. If the patient continues to receive such large doses, kidney damage and bone deformity can occur.

What precautions should be taken?

Vitamin D is not a safe drug and large doses cause toxicity. Do not use doses more than recommended above. People should be discouraged from using fish liver oil preparation as tonics for months together. Such preparations are sold over the counter without prescription and are known to cause vitamin D toxicity when used continuously for a long time.

PART II

COMMON MEDICAL PROBLEMS: HOW TO TREAT

AND

WHEN TO REFER CASES TO THE DOCTOR

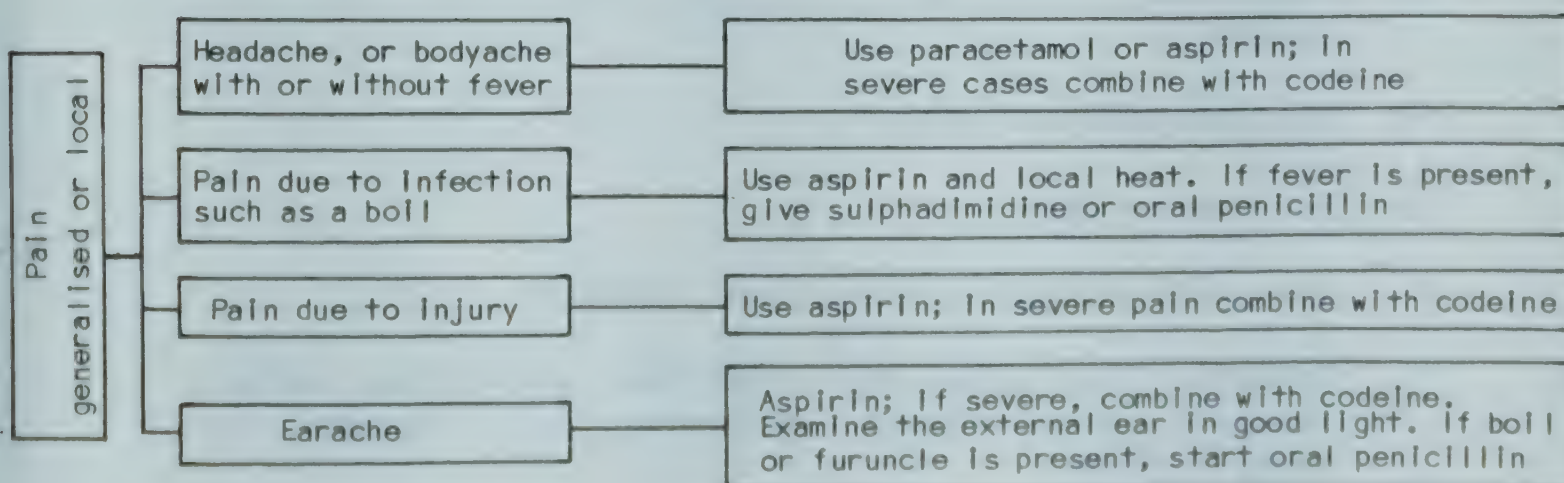
1. PAIN

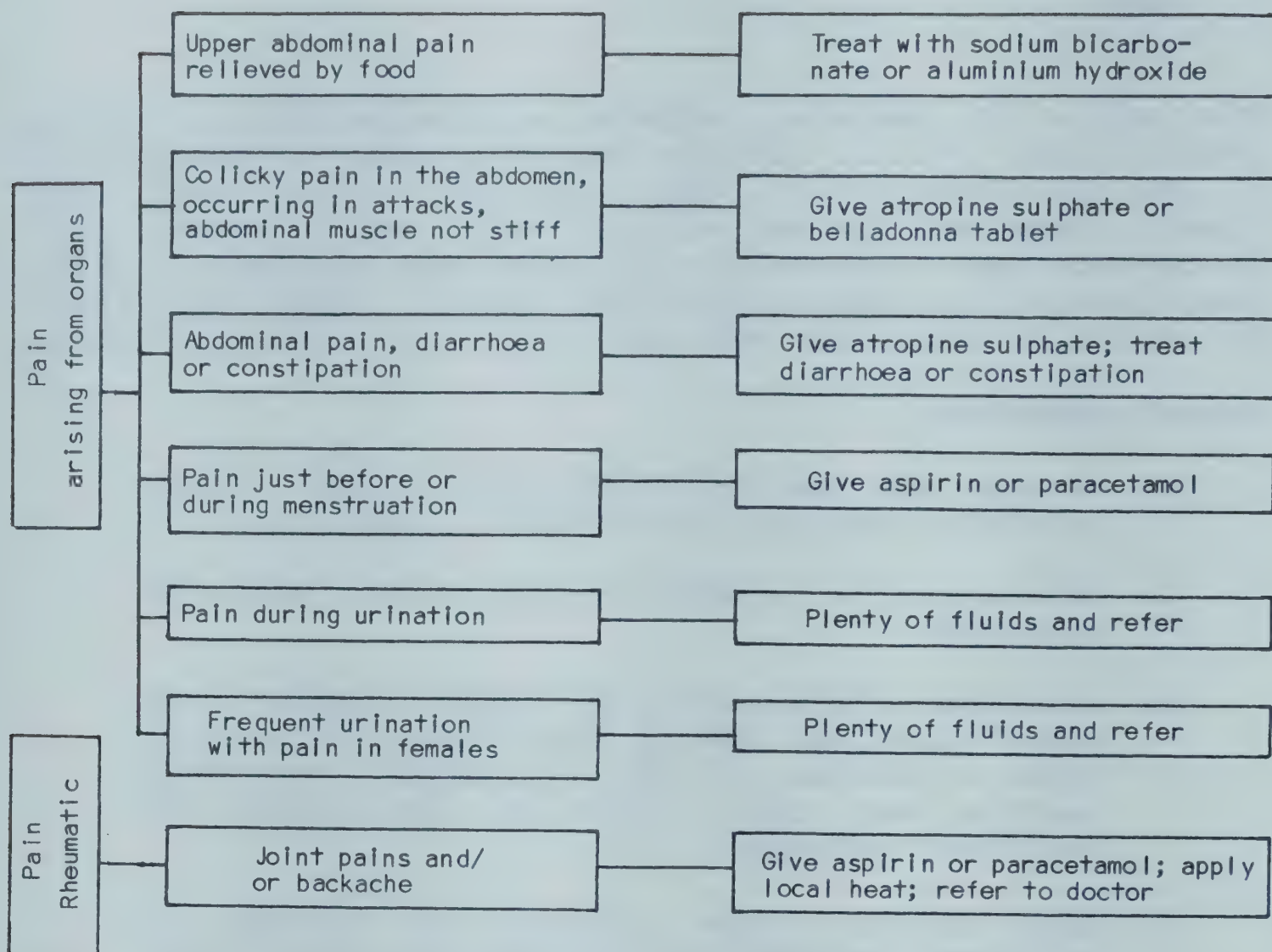
Pain can be (a) headache, bodyache or backache with or without fever; (b) due to local infection such as a boil; (c) rheumatic, or (d) due to disease of an organ (eye, ear, tooth, heart, lung, stomach, intestine, bladder, uterus, testis, etc.). Rheumatic pain is the term used to describe pain coming from muscles and joints. Always look for the cause of the pain. However, relief from pain can be obtained by using drugs which may not cure the underlying disease.

General guidelines:

1. Patients who complain of pain in the chest or have painful and swollen joints should be advised rest.
2. If the pain is localized, giving the part rest will be helpful.
3. Local heat (hotwater bag or hotwater bottle) gives relief from pain due to local infection, such as boils or abscess. In order to prevent a burn while applying heat place a piece of cloth between the bottle and the skin.
4. Acute abdominal pain accompanied by vomiting and stiffness (hardness) of the abdominal muscles must be referred to the doctor immediately.
5. In all other abdominal pains, advise the patient to avoid spices and chillies in the food.
6. Sometimes patients suffering from pain neglect their diet; in such cases, ensure adequate food and water intake. Do not starve the patient.

How to treat?





When to refer?

1. Acute chest pain, particularly in elderly people, should be referred immediately.
2. Acute abdominal pain when accompanied by vomiting and stiffness (hardening) of abdominal wall should be referred immediately.
3. Pain due to severe injuries (fracture or open wounds).
4. Eye pain and ear pain
5. Any severe pain
6. Pain persisting for more than 3 days.
7. Headache associated with vomiting, paralysis, mental change, high blood pressure or change in consciousness.

What precautions should be taken?

1. Do not use aspirin to treat abdominal pain.
2. Do not use aspirin to treat pain associated with abdominal symptoms such as nausea, vomiting and pain.
3. Do not repeat codeine frequently as it may cause constipation.
4. Avoid atropine in patients older than 60 years of age as it may cause eye or urinary problems, and aspirin in children below 12 years of age suffering from chickenpox or influenza.
5. Refer the patient with abscess for surgery.

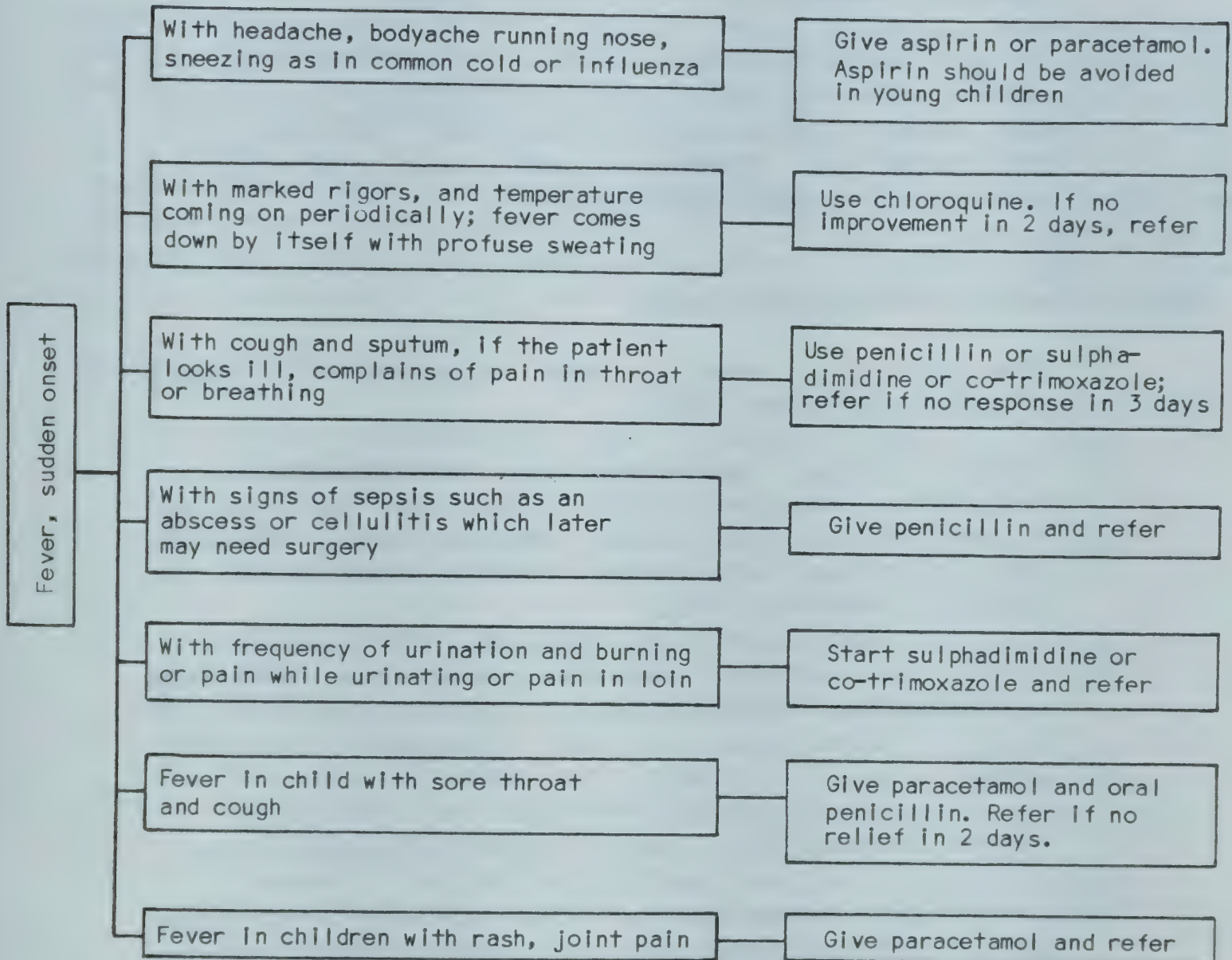
2. FEVER

Fever is often a symptom of infectious diseases and may be a valuable guide to know the severity of the disease. Mild cases need no immediate treatment with drugs.

General guidelines:

1. If a patient gets sudden fever in a place where malaria is known to occur, take a blood smear for examination for malaria parasites.
2. Advise rest in bed as long as there is fever.
3. Give plenty of fluids, such as plain water (preferably boiled and cooled), rice water, vegetable soup, buttermilk, milk, weak tea or coffee, coconut water or lime juice. Sugar and salt may be added to taste.
4. Meals should be light. Avoid food that is spicy, pungent or excessively oily. Do not starve the patient.
5. If the patient is uncomfortable because of fever, bodyache or headache, give aspirin or paracetamol three times a day.
6. If the armpit temperature is more than 39.5°C or if the patient is delirious because of high fever, give sponge with tepid water. Remove all clothes except underwear. Sponge with a cloth the entire body, part by part, with water at room temperature (not very cold). Do not dry the skin. The water will evaporate and cool the body.
7. In case of fever associated with sore throat and pain, advise repeated gargling with warm water containing common salt; add one teaspoonful of salt to a glass of warm water.

How to treat?



When to refer?

1. Fever of acute onset which does not respond to treatment in 2-3 days.
2. If the patient is very ill, too weak even to eat and drink, or is dehydrated.
3. If the patient talks incoherently, does not recognize people, is drowsy or unconscious, or has convulsions.
4. If the patient complains of marked headache and has attacks of vomiting or signs of stiffness of neck.

5. All fevers with a duration of more than 7 days or occurring intermittently. Remember that tuberculosis commonly presents as an irregular fever.
6. If a child has fever, cough, rapid breathing and chest indrawing give oral penicillin and refer to the doctor immediately. Similarly, children with difficulty in breathing and face discoloration should be referred immediately.

What precautions should be taken?

1. When aspirin is used, it must be given with plenty of water and after food.
2. Before giving sulphonamide, co-trimoxazole or penicillin, enquire whether the patient has ever had a reaction, such as skin rash, itching, or joint pain following such drugs. In such cases avoid the possibly offending drug.
3. Watch the patient for any reactions following sulphonamide, co-trimoxazole or penicillin. Stop the drug if signs such as rash, itching or urticaria occur.
4. Ensure adequate food, water intake and urine output.
5. Do not give purgatives such as castor-oil or epsom salt. If the patient is constipated, advise glycerine suppository in children or simple enema in adults.

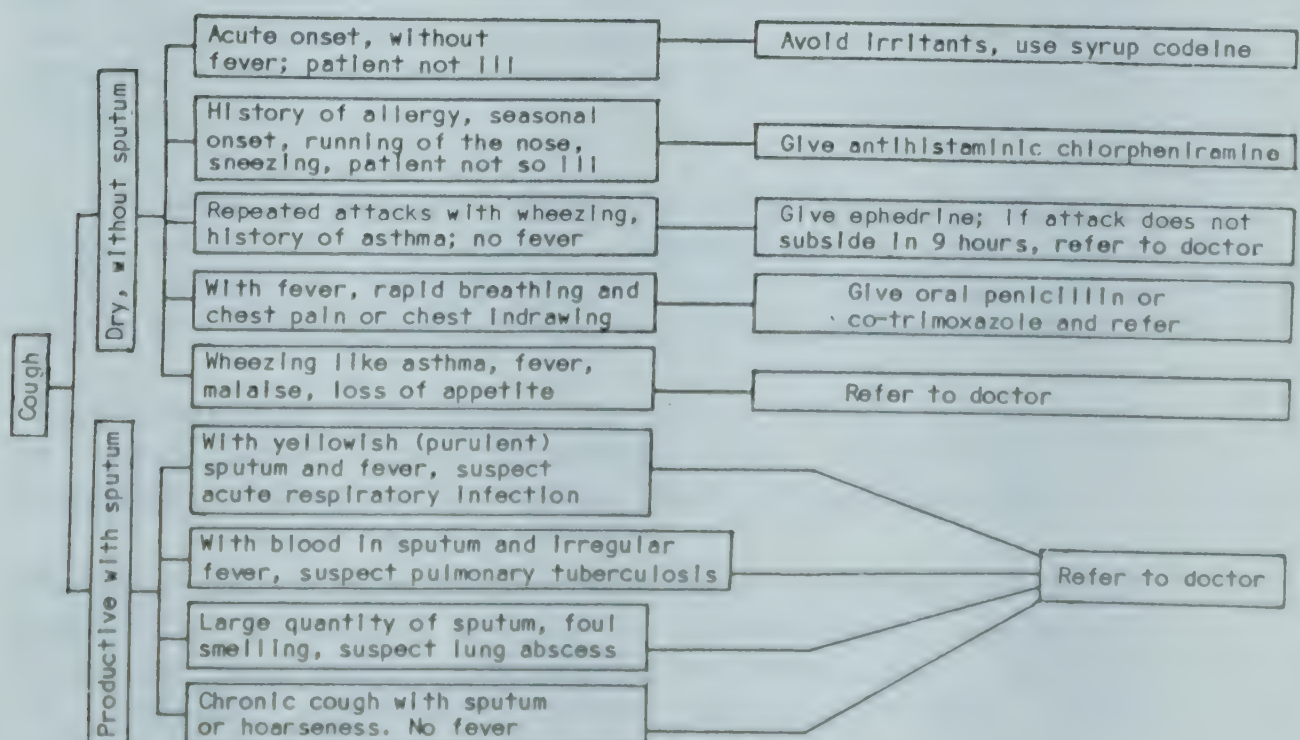
3. COUGH

Most types of cough do not require drug treatment. Basically, cough cleans the windpipe by throwing out the irritating material which may reach it from outside or is produced locally. This is necessary for preventing mechanical obstruction to breathing. Therefore, cough is a friend and not a foe. The common respiratory irritants are: fumes, cigarette or bidi smoke, smoke from a chulah, dust particles, pollens from flowers, and germs. Some of these also give rise to allergy and cough. The commonest cause of transient cough is common cold or influenza.

General guidelines:

1. Avoid respiratory tract irritants such as smoke, chemicals, dust and cigarettes.
2. Avoid cold and dry air. A warm room with a humid atmosphere is beneficial.
3. Simple steam inhalation and warm drinks bring relief.
4. Patients should take a good amount of fluids.
5. In case of cough with plenty of sputum, encourage the patient to cough voluntarily from time to time.
6. Remember, saliva is the best natural soothing agent for an inflamed throat and it can easily be increased by keeping a sugar candy or lemondrop in the mouth.

How to treat?



When to refer?

1. Any cough that does not respond to therapy within 4-5 days.
2. Cases of productive cough referred to above and children with whooping cough.
3. If the patient looks ill, has difficulty in breathing, or is blue (cyanosed).
4. Persistent cough in cigarette or bidi smokers.

What precautions should be taken?

1. Ephedrine may cause palpitation. Avoid it in patients with known heart disease or high blood pressure. It may also cause retention of urine in old people.
2. Chlorpheniramine, if used excessively, causes drowsiness and drying of respiratory secretions.
3. Do not use antibiotics or sulphadimidine or co-trimoxazole in patients with cough due to common cold or influenza. In such cases cough is self-limiting and the drugs have no action against the organisms causing the disease.

4. BREATHLESSNESS

Breathlessness or shortness of breath, on exercise or at rest, is a manifestation of many forms of lung and heart diseases. The patient has to make an effort for breathing even for the usual level of physical activity.

Acute breathlessness due to lung disease can be caused by a foreign body in the respiratory tract, acute lung infections such as pneumonia or an attack of asthma, or it could be a terminal event in a serious disease where the brain centre fails. Acute breathlessness also occurs due to sudden failure of the heart.

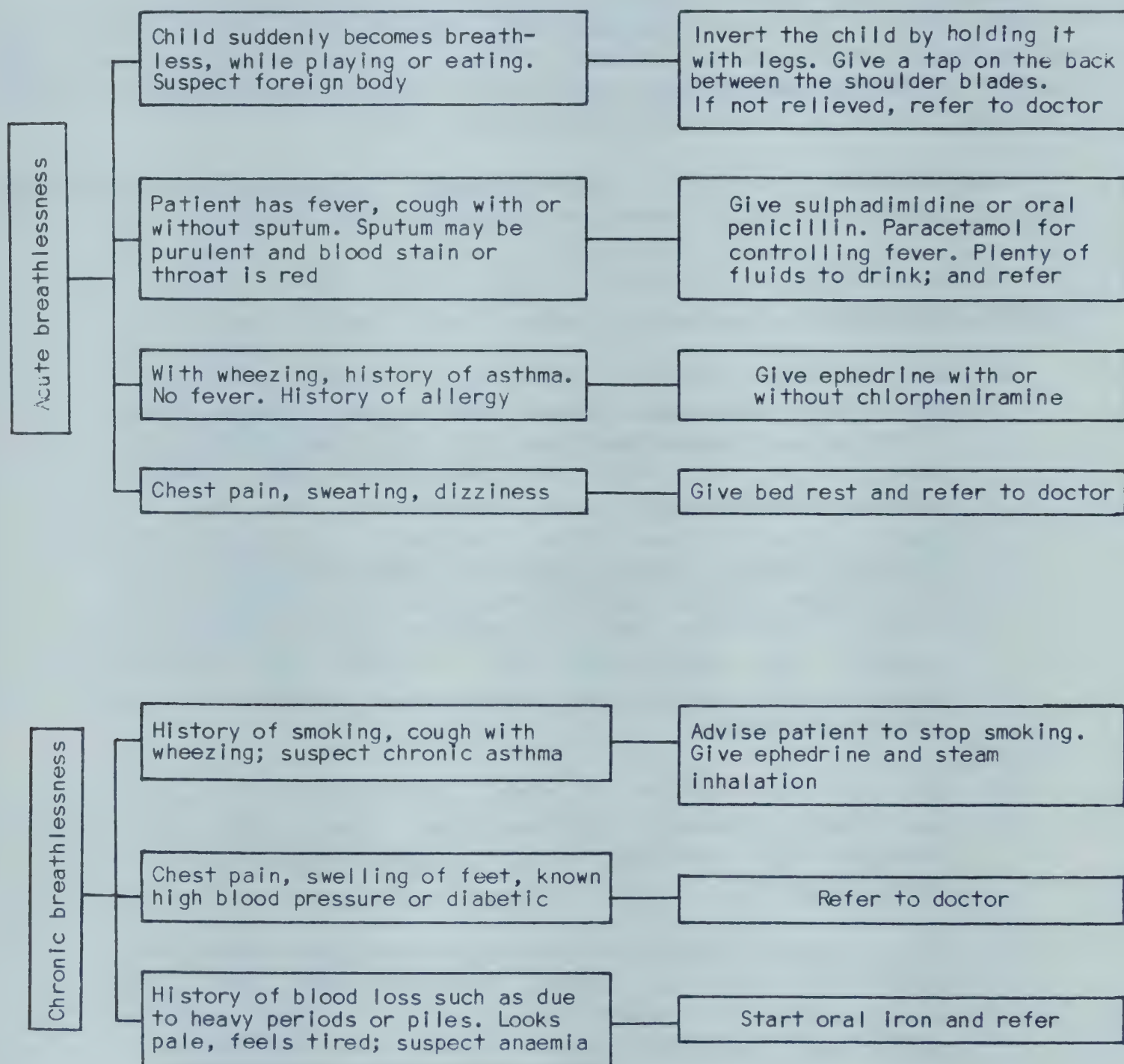
Longstanding (chronic) breathlessness is due to chronic lung disease, asthma, severe anaemia or chronic heart disease.

General guidelines:

1. Ask for the patient's history to decide whether it is acute or longstanding (chronic). Always think first of a foreign body in the respiratory tract in case of an otherwise healthy child who suddenly becomes breathless.
2. Breathlessness associated with fever and cough with or without sputum indicates lung or throat infection. In children rapid breathing (more than 50 per minute) is considered as a sign of serious respiratory infection and an indication to administer drug.
3. Ask for the history of high blood pressure or take the blood pressure. Patients who have high blood pressure can suddenly develop breathlessness due to heart failure.
4. If an elderly patient suddenly develops breathlessness, pain in the chest, becomes pale and cold, feels giddy or perspires a lot, he is probably suffering from heart attack. Refer him immediately.
5. Breathlessness due to asthma or an attack of allergy is associated with wheezing and difficulty in breathing indicated by retraction of neck muscles.
6. Breathlessness due to chronic heart disease becomes worse on exertion or in a lying-down position. Patients feel more comfortable on assuming a sitting or upright posture. These patients also have swelling of the feet.

7. Prolonged breathlessness causes loss of body water. Further, people who have difficulty in breathing may avoid drinking water. Hence, adequate fluid intake must be ensured.

How to treat?



When to refer?

1. If the foreign body does not come out.
2. Patients with suspected acute or chronic heart disease as mentioned above.

3. Breathlessness associated with pain in chest.
4. If acute asthmatic attack is not relieved by treatment within 12 hours.
5. Chronic asthma and chronic lung disease where patients cough out large amounts of sputum.
6. Anaemia after starting iron treatment.

What precautions should be taken?

1. Do not use ephedrine in old persons and in patients with heart disease.
2. Advise patient to drink plenty of liquid.
3. Advise avoid use of salt in a patient with breathlessness who has high blood pressure or heart disease.

5. VOMITING

Vomiting results from the ingestion of a nauseating or irritating material, including spoilt food, inflammation of the stomach or gut, or high fever. Pregnancy, travel sickness, half headache (migraine) and vertigo (a sensation of reeling) are other common causes of vomiting. Vomiting is also associated with serious illnesses, such as painful fracture, heart attack, acute abdominal pain, brain disease and head injury or closed abdominal injuries with internal organ damage. Persistent vomiting may be due to stomach ulcer or obstruction in the gut.

When the vomiting is due to the ingestion of spoilt food or irritating substances, it helps to throw out the irritating material and hence is beneficial. However, excessive vomiting causes loss of salt and water and exhausts the patient. Vomiting over a long period of time prevents eating and thus results in starvation.

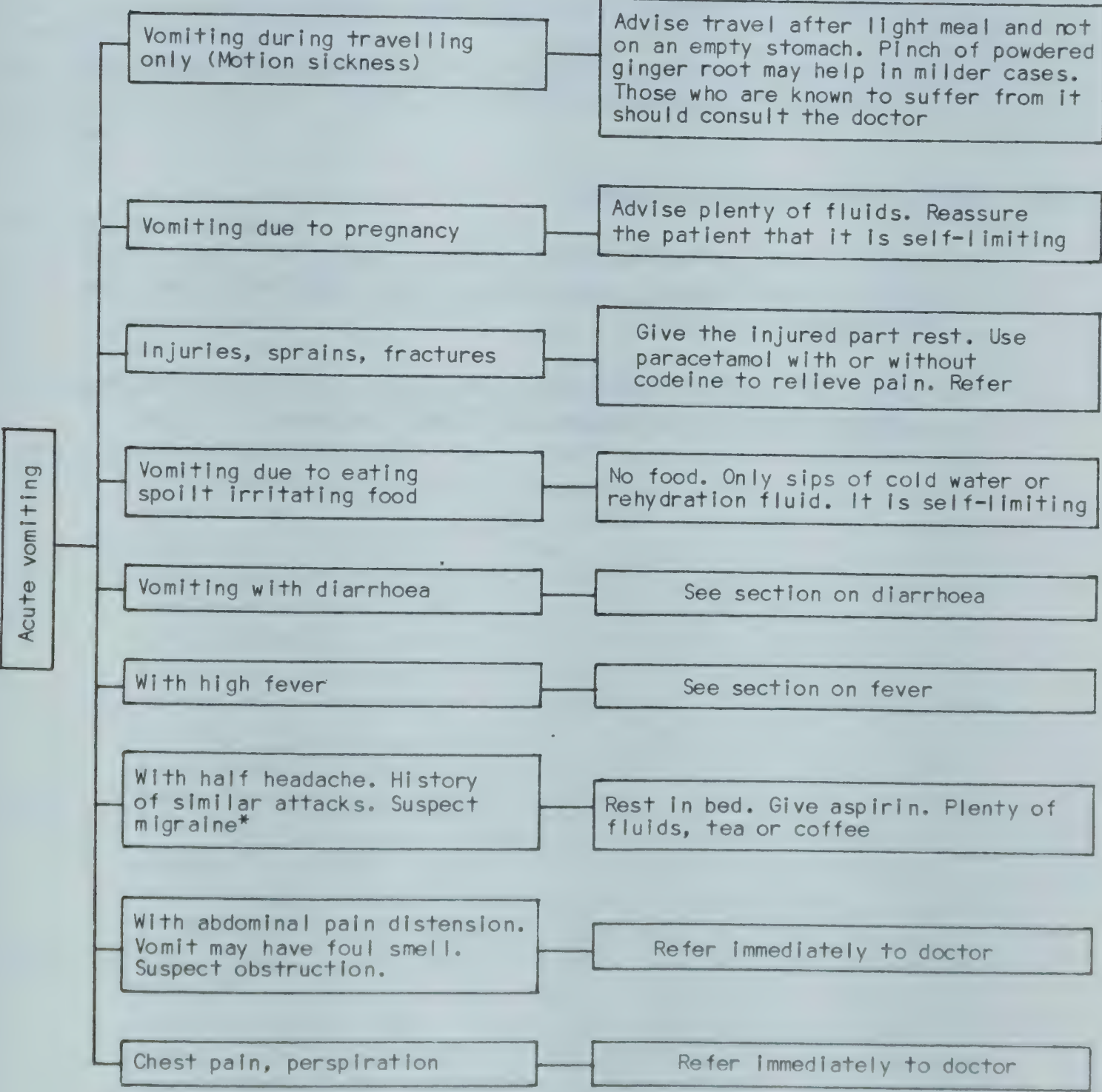
The vomited material may be watery or slimy; it may contain partly digested food or blood; or it may be dark green or brown and foul smelling.

General guidelines?

1. Look at the vomit, if available. If not, ask the patient what it contains - especially, enquire about blood and smell. Find out how long the vomiting has been present.
2. Find out if the patient has high fever, severe headache, diarrhoea, chest pain, abdominal pain or any injury.
3. Ask the patient, if he has passed a stool and whether he has passed gas (flatus). If not, the patient should be referred to the doctor immediately.
4. If vomiting has started suddenly, after ingestion of food, suspect food poisoning.
5. If vomiting occurs in a young woman with missed period (menstruation), particularly in the morning, think of pregnancy as a cause.
6. A patient who is vomiting should not eat solid food. He is advised to take sips of ice-cold water, cold weak tea, lime juice or rehydration fluid. If diarrhoea is present, give plenty of rehydration fluids. Addition of a pinch of ginger powder would help.

7. Preserve the vomit, if available, for examination by the doctor.

How to treat?



When to refer?

1. If vomiting is accompanied by acute abdominal pain, severe chest pain, severe headache, high fever, convulsions, or dehydration.

*Migraine is a severe headache which usually involves one side of the head; it is usually associated with blurring of vision, feeling of reeling and vomiting. It occurs periodically.

2. If the vomit contains blood.
3. If the vomit is dark coloured and foul smelling.
4. If the vomiting is not controlled within 24 hours and the patient looks ill.
5. Persistent vomiting in a pregnant woman.
6. All patients with a history of repeated attacks of vomiting of long duration.

What precautions should be taken

1. Look for dehydration (see section on Oral Rehydration Salts, page 33) in all patients who are vomiting.
2. Watch the urine output. Decrease in urine output suggests need for increased fluid intake.

6. DIARRHOEA

Diarrhoea is a condition where loose or watery stools are passed three or more times per day. The stool may contain blood and sticky material. Acute diarrhoea is due to (a) intestinal infection, (b) infection elsewhere in the body (especially in children) and (c) eating food which is spoiled or contaminated with a toxin or an irritant material. Frequent attacks of diarrhoea contribute to malnutrition. Malnourished children are liable to get infection frequently. Thus, a vicious circle of malnutrition and infection is created.

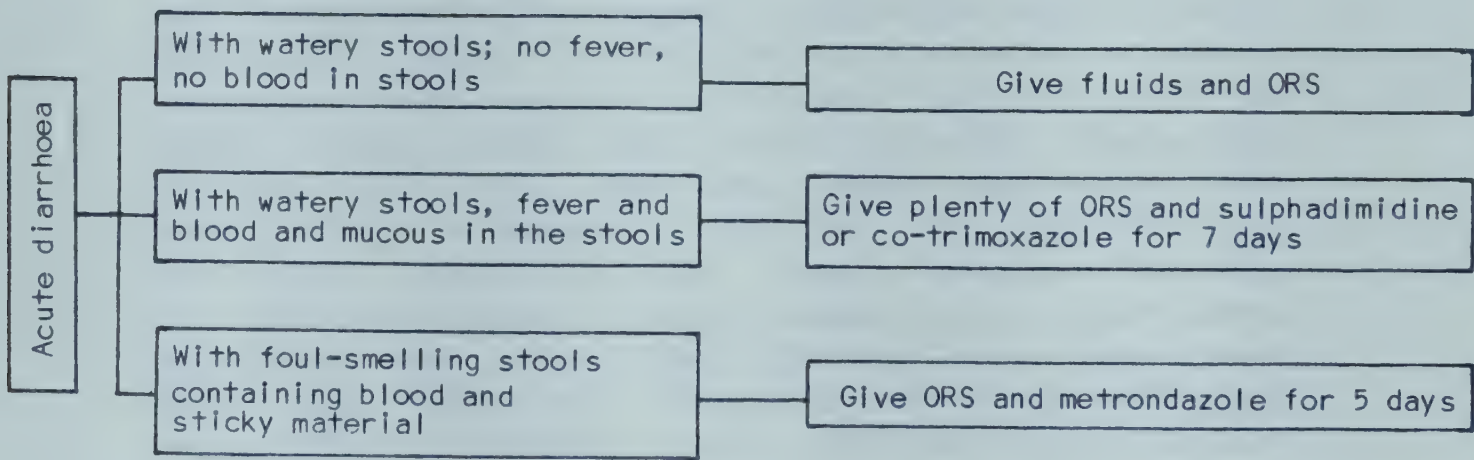
General guidelines

1. Enquire about the food eaten in the last 24 hours, especially stale fish or meat and milk products.
2. Acute diarrhoea causes dehydration (loss of salt and water from the body); therefore, the most important treatment of any acute diarrhoea is to replace the salt and water lost. In early stages diarrhoea can be treated at home by giving fluids such as rice water, dal soup, buttermilk, green coconut water, weak tea, and lime juice with added sugar and salt. In breast-fed babies give breast milk more often. If child is not breastfed, amount of milk feeds is increased and given diluted with equal amount of water. Watch for signs of dehydration. Dehydration can be recognized by the following symptoms and signs: (a) moderate: dry mouth; thirst; sunken eye; rapid pulse; rapid deep breathing; scanty and dark urine; the patient is restless or lethargic; abdominal skin when pinched retracts slowly and (b) severe: rapid and weak pulse, cold limbs, deeply sunken and very dry mouth and eyes, bluish, pale skin, fast breathing and finally unconsciousness; abdominal skin when pinched retracts very slowly (inelastic). No urine for 6 hours. All cases of dehydration should be given oral rehydration solution (ORS) and severe cases should be referred to the doctor immediately for intravenous therapy.
3. Fever suggests an infective cause such as bacillary dysentery.
4. Stools are of large volume and watery in infective (bacterial such as cholera or viral) and irritant diarrhoeas. They are of small to moderate volume and contain blackish blood in bacterial dysentery. They are small, foul smelling, sticky and contain blackish

blood in dysentery caused by a parasite called amoeba.

- 5. If there is associated griping pain in the abdomen, give atropin sulphate or belladonna tablet.
- 6. Drugs such as codeine and opium reduce the volume of stools but can make the patient more ill. Do not use them.
- 7. Antibiotics are not effective in treating the majority of diarrhoeas. They are indicated only for cholera and bacillary dysentery.
- 8. Children accustomed to taking solid foods and adults should be given easily digestable food such as boiled rice, chicken soup, boiled vegetables, eggs, fish or cooked meat and fruits like ripe bananas, tomatoes or pineapples, some fat and oil may be given. Spices and chillies must be avoided. Food should be offered to children 5 to 6 times a day. Further, the child should be given one extra feed per day for a week after the diarrhoea stops.

How to treat?



When to refer?

- 1. Acute diarrhoea with severe dehydration (see page 33).
- 2. Acute diarrhoea (less than 10 liquid stools per day) not controlled within 24-48 hours.
- 3. Acute diarrhoea with severe vomiting.

In all the above patients, ORS should be started and continued on the way to the PHC.

4. All persistent (chronic) diarrhoeas.

How is ORS supplied and given to patients?

1. ORS should be given even when there is vomiting. If a child vomits, wait 10 minutes then give small amount of ORS by spoon.
2. Note the urine output. Enough ORS should be given so that the patient continues to pass plenty of urine.
3. In case of mild diarrhoea with no signs of dehydration, the mother or relatives of the child should be instructed to give more fluids than usual. A child under 2 years of age needs to cup (50-100 ml.) of fluids after each loose stool. Elder children need double the amount. Adults should be advised to drink as much as they want. Thirst is a good guide. This prevents dehydration.
4. In moderate dehydration (see page 33) give 50 to 60 ml. of ORS per kg. of body weight within 4 to 6 hours. If weight is not known, then give 400 ml. below 6 months, 600 ml. between 8 to 12 months and 800 ml. above 2 years. Once the child is rehydrated the mother should be instructed to give ORS 50 to 100 ml. (to cup) after each loose stool. Older children should receive double the amount (100 to 200 ml.). Breastfeeds should continue between drinks of ORS solution. In older children and adults thirst is a good guide for fluid needs; they can be told to drink as much as they want to satisfy the thirst.

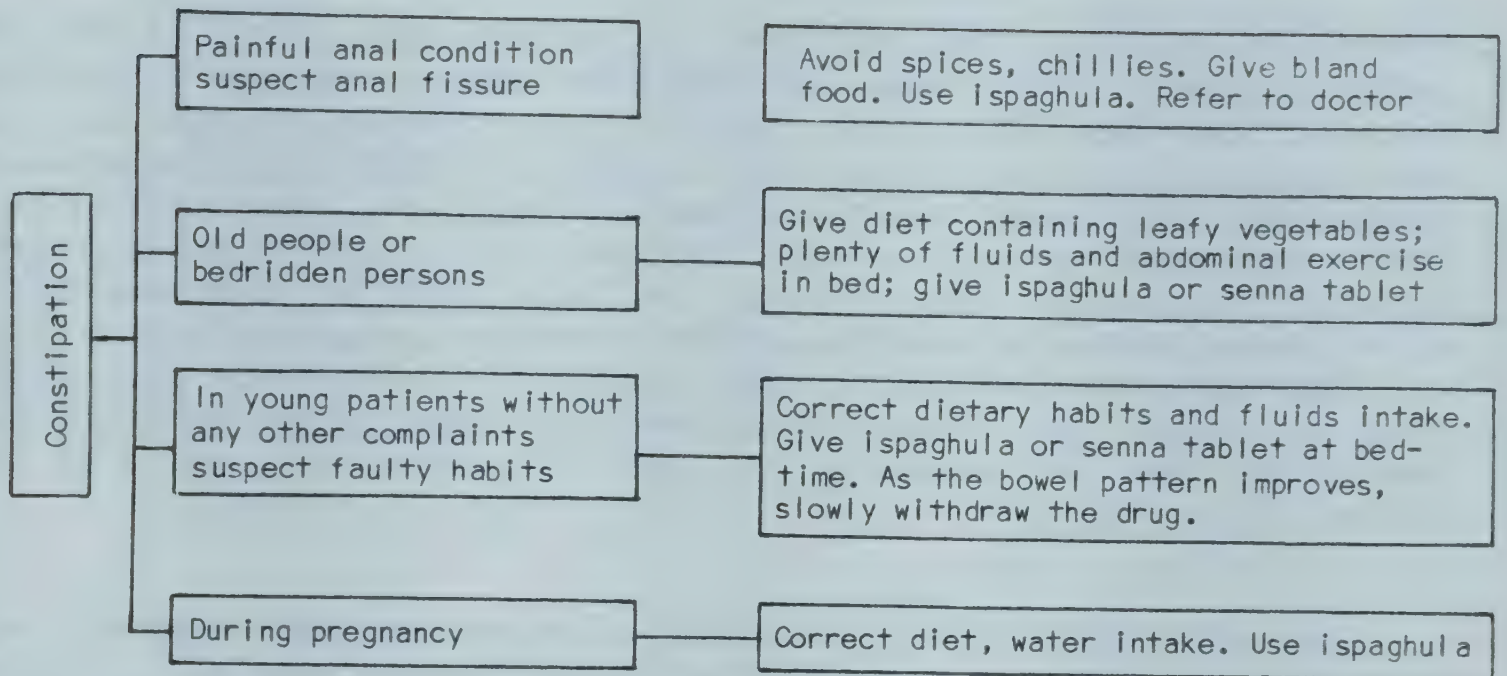
7. CONSTIPATION

A patient who complains of constipation passes dry and hard stools less frequently than once a day. It may be acute, developing suddenly or long-standing (chronic). Acute constipation may be a part of a more serious illness such as acute bowel obstruction. In that case the patient has abdominal pain, vomiting and distension (bloating) and cannot pass even wind (flatus). Such cases should be referred to the doctor immediately. Constipation may also occur following an attack of diarrhoea or the day after taking a purgative; this needs no treatment. Long-standing constipation may be due to (a) faulty bowel habits - habitually not attending to the nature call in time, (b) due to faulty diet that is low in roughage, fibre or water content, (c) lack of exercise, (d) painful lesions in the anal region such as cracking of skin near anal region (anal fissure), and (e) diseases of the bowel. Constipation is common in old people and during pregnancy because of difficulty in using abdominal muscles during evacuation. Constipation in children is due to faulty dietary habits; correction of these relieves constipation.

General guidelines

1. Do not give purgative to patients with acute, suddenly developed constipation. Refer them to the doctor.
2. Remember that many patients with normal stools and normal frequency of defecation imagine that they are constipated. They need reassuring and no drug treatment.
3. Take the detailed history in a patient who complains of chronic constipation and have a look at the stool, to check whether it is really scanty, hard and with or without slimy material. Pain in the anal region suggests anal fissure.
4. Enquire about food habits, intake of leafy vegetables, bran and other fibre-containing foods, water intake, exercise and the regularity of bowel habits. Correction of these is far more important than any drug.
5. In all normal subjects with chronic constipation attempts should be made at bowel training. Advise the patient to spare hour every morning regularly to visit the toilet. Ask him to drink plenty of water, especially in summer, and to eat leafy vegetables and food containing vegetable fibres. Patients should also be encouraged to take physical exercise, such as walk for to 1 hour daily.

How to treat?



When to refer?

1. Acute constipation, especially when the patient is vomiting, has not passed even wind and appears ill, suspect gut obstruction.
2. Chronic constipation that does not respond to treatment within 2 weeks.
3. Recent unexplained constipation (not acute) in an elderly person whose bowel habits were always regular.
4. Patient who has persistent pain in abdomen or blood in stools or experiences pain during evacuation.
5. Persistent constipation in children.

What precautions should be taken?

1. Do not use purgative frequently to treat constipation as habit may be formed.
2. Do not use purgatives to treat constipation associated with fever and following heart attack.

8. ANAEMIA

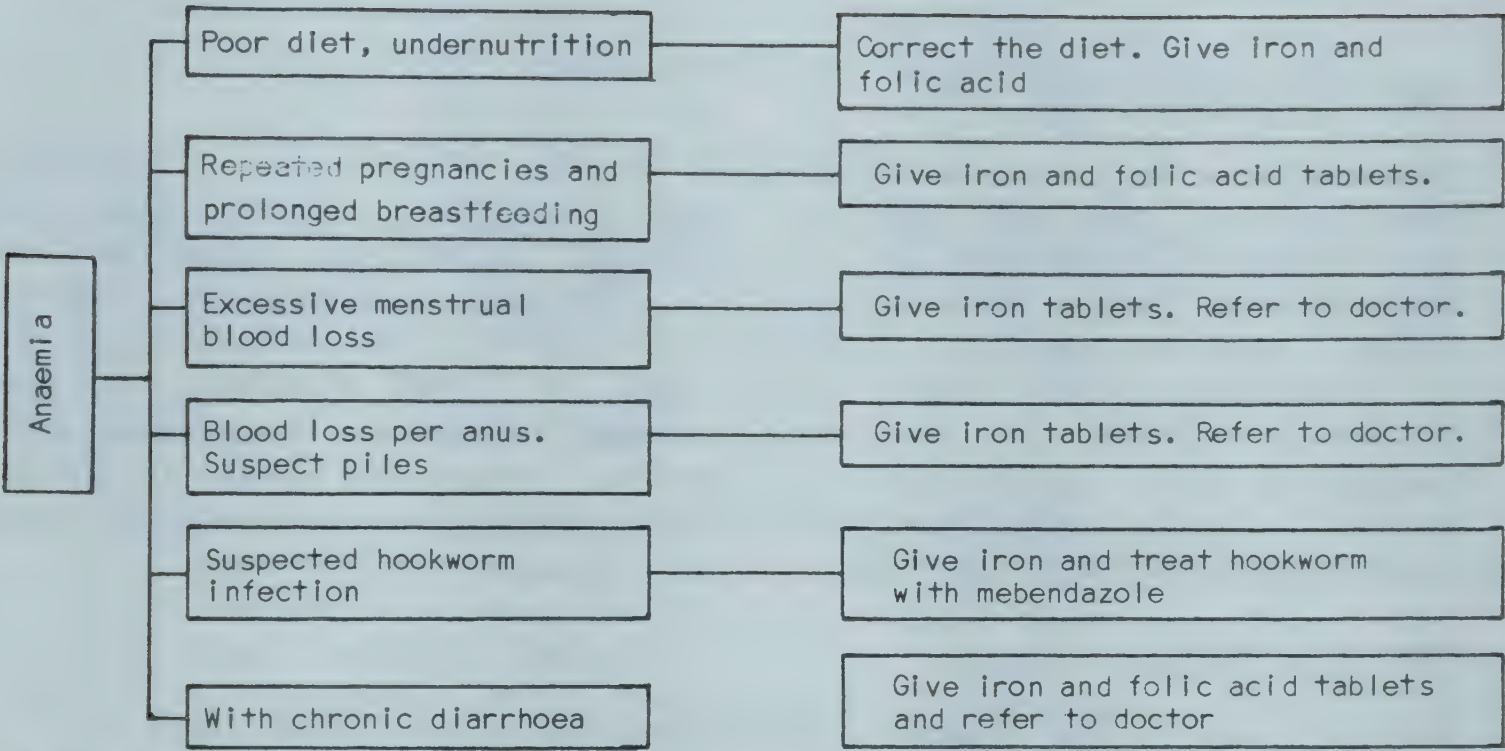
Anaemia is caused by the deficiency of haemoglobin, which is the red colour pigment of the blood. Haemoglobin carries oxygen to various parts of the body. The blood formation is affected if the diet is deficient in proteins, iron, folic acid or vitamin B₁₂. Anaemia is also caused by excessive or prolonged blood loss. Women lose blood during menstruation every month. In some women blood loss is heavy. Repeated pregnancies also deplete the body store of iron and folic acid, thus leading to anaemia. Other important causes of blood loss are bleeding piles, ulcers in the gut and hookworm which suck blood from the intestines. Chronic diarrhoeas can also cause anaemia. The commonest cause of anaemias is the deficiency of iron with or without folic acid.

Patients with anaemia complain of tiredness and weakness and show lack of desire to work. The nails and tongue look pale. Severe anaemia causes general pallor and swelling of the feet.

General guidelines

1. Suspect anaemia as the cause of tiredness and vague ill health, especially in women of child-bearing age.
2. Take history in detail, repeated pregnancies, heavy menstrual blood loss, blood loss per rectum as in piles, chronic diarrhoea, habit of going to fields without using shoes. This will give a clue to the cause of the anaemia.
3. Enquire about the food intake and eating habits. Advise patient to eat more green, leafy vegetables, bajra, ragi, beans and peas. Jaggery is a good source of iron. Meat, fish and chicken also have high iron contents but they are more expensive.
4. Give iron and folic acid tablets to women throughout the pregnancy to prevent anaemia.
5. Give iron tablets to any person who has lost blood as a result of an injury or accident, in order to allow him to make good the blood loss.
6. Remember, it is far better to prevent anaemia by using iron in a patient who is likely to develop anaemia because of the causes mentioned above than to treat it later, when developed.

How to treat?



When to refer?

1. All severe anaemias.
2. Anaemia associated with other illnesses such as fever, cough and enlarged glands in the neck or elsewhere in the body.
3. Anaemia that does not respond to iron with or without folic acid even after one month of treatment.
4. Anaemia with known causes of bleeding such as piles and heavy menstruation.

What precautions should be taken?

1. Instruct the patient to take iron tablets after food, as iron tablet sometimes causes stomach upset.
2. Inform the patient that the stools could be black during iron therapy.
3. Reduce the dose if iron causes stomach ache, diarrhoea or constipation.
4. Remember, the response to iron therapy is gradual and it takes weeks or months for blood to become normal. Even after that continue iron for 3-6 months.
5. If the patient cannot tolerate oral iron at all - refer to PHC.

9. TUBERCULOSIS

What is tuberculosis (TB)?

Tuberculosis is a disease caused by a type of bacteria. It affects many parts of the body such as lungs, intestine, kidney, brain and bone. Lung tuberculosis is the commonest. A patient suffering from tuberculosis has a loss of appetite, feeling of tiredness, loss of weight, chronic cough and irregular low fever. The cough may be dry or associated with sputum which may be blood stained. In some patients, glands in the neck become enlarged. A person with low-grade fever associated with chronic cough and loss of weight should be suspected of suffering from tuberculosis. All such cases should be referred to doctor.

How to treat?

The drugs which are commonly prescribed for tuberculosis are:

- Streptomycin given by injection.
- Isoniazid tablets)
- Rifampicin capsules) given orally
- Thioacetazone tablets)
- Ethambutol tablets)

What precautions should be taken?

1. Make sure that the patient has understood how to take drugs and that he takes them regularly as prescribed by the doctor, without defaulting. This is very essential for curing the disease.
2. Keep a record of body temperature and body weight. The body weight will increase gradually and the temperature will settle down within a few weeks. The cough will also decrease and ultimately stop within 4-6 weeks.
3. Watch for the side-effects of the drugs prescribed. All the drugs can give rise to allergic rash. Enquire about any disturbances of hearing or giddiness. This can be caused by streptomycin. Isoniazid sometimes causes tingling and numbness in limbs, muscle weakness and jaundice - which may turn the eyes and urine yellow. Rifampicin may cause loss of appetite, irregular fever again in patients whose fever has earlier settled down, and jaundice. Inform the patient on rifampicin therapy that his urine and sputum may become orange red in colour. This does not cause any harm. Ethambutol sometimes produces

disturbances of vision; enquire about it. Thaicetazone may give rise to skin rash, joint pains, ulcers in the mouth and jaundice. Observe the patient regularly and, if you notice any such effects, refer him to the doctor.

4. Advise the patient about nutrition and ensure that he visits the doctor for checking and instruct regarding further drug therapy.

How to prevent spread of tuberculosis?

1. Remember, tuberculosis can be completely cured if the drug treatment is carried out as prescribed properly and for the desired period. Make sure that the patient gets his drug supply regularly. Inadequate or interrupted treatment causes drug-resistant bacteria. Such cases then do not respond to drug therapy.
2. Any time during treatment, if a patient becomes acutely ill or he coughs out blood, refer him to the doctor.
3. Tuberculosis spreads through coughing. Hence the patient should be instructed to cover his mouth with a handkerchief while coughing.
4. People should be warned against the danger of spitting anywhere.
5. Undernutrition and overcrowding promote the spread of tuberculosis. Educate the people about the preventive aspect of this disease, emphasizing that if they seek early advice, the disease can be cured completely.
6. Ensure BCG vaccination in children.

10. LEPROSY

What is leprosy?

Leprosy is caused by lepra bacteria. These bacteria cause characteristic lesions in the skin and damage the nerves. The disease affects the face, nose, ears, eyes and the glands. Initially, it produces hypo-pigmented circular patches without itching. In some cases, these patches may have a red, raised margin. If one tests the pain sensation by pricking these patches with a pin, the patient will not feel it (anaesthesia). This is characteristic of leprosy. In one type of leprosy called lepromatous leprosy, the skin becomes furrowed and nodular. The eyelashes fall. If not treated in time, ulcers are formed with marked destruction of the face including the nose, ears and eyes. This type of leprosy is highly infectious and progresses rapidly. If untreated, there will be destruction of the nerves and later on destruction of body parts supplied by these nerves. All cases of suspected leprosy should be referred to the doctor for confirmation.

How to treat?

The drugs which are commonly prescribed for leprosy are:

- DDS (Sulphone) tablets)
- Rifampicin capsules) given orally
- Clofazimine tablets)

What precautions should be taken?

1. Assure the patient that the disease is completely curable and ask him not to get panicky about it.
2. Do not advise segregation.
3. Make sure that the patient understands how to take drugs and that he takes them regularly as prescribed by the doctor without defaulting. This is very essential for the cure of the disease.
4. Watch for the side-effects of the drugs prescribed. DDS causes loss of appetite, nausea and vomiting. It may also give rise to allergic rash. Rarely, it causes jaundice, ulcers in the mouth and anaemia. Patients with anaemia would look pale and complain of weakness and tiredness. Rifampicin may also cause loss of appetite. In addition, it may give rise to fever and jaundice but this is very rare with the doses used in the treatment of leprosy. Clofazimine

sometimes changes the colour of the skin to reddish brown. Observe the patient regularly. If you notice any side-effects, refer the patient to the doctor.

How to prevent the spread of leprosy?

1. If you observe any individual with specific changes mentioned above on his face or if you find a hypo-pigmented patch on the body associated with diminished sensation to pinprick, refer the patient to the doctor for examination.
2. All the members of the family in contact with the leprosy patient should be examined.
3. Educate the people that leprosy is curable and that they should seek early advice if they notice any hypo-pigmented patch on their body.
4. Remember, treatment for leprosy has to be carried out without default for many months so as to obtain complete cure. This should be emphasized to the patient and the dangers of inadequate or no treatment. Make sure that the patient gets his supply of the drug regularly.

11. WOUNDS, BURNS AND SHOCK

WOUNDS

A wound is a break in the skin occurring due to injury.

1. Such a break may cause bleeding which must be attended to immediately.
2. It may cause local pain and swelling.
3. It may get infected due to the entry of bacteria. Such infection if untreated can spread.

Wounds are sometimes associated with fractures of bones.

How to treat?

Bleeding

Bleeding from the wounds can be stopped by keeping local pressure with thumb and fingers or a clean cloth, cotton or gauze for a few minutes. Raising the part may help further. If bleeding is severe and continuous, apply immediately a tourniquet with a rubber band or a piece of cloth or a piece of string, a little above the wound. Always use a sterile gauze for dressing. Press the dressing upon the wound. Cover it with a thick cotton pad and bandage it firmly, covering the entire wound and the adjoining area. Release the tourniquet if applied. If blood still oozes out of the bandage, do not remove the bandage but add more pads. In case the excessive bleeding continues, use the tourniquet again and refer to the doctor.

Bleeding from a tooth socket can be arrested by putting a small piece of sterile gauze firmly on the socket and asking the patient to bite hard on the pad for 10 minutes.

If the bleeding is from inside the ear, do not put anything in the ear. Do not plug the wound. Cover the whole of the ear with a bandage and refer to the doctor.

To arrest the bleeding from the nose:

- (a) Ask the patient to close the nostril firmly by pinching the nose with thumb and finger for 10 minutes and breathe through the mouth.
- (b) Ask the patient to sit forward and spit out any blood collected in the mouth.

- (c) Ask the patient not to blow his nose.
- (d) If the nasal bleeding is due to a blow on the head, refer the patient to the doctor.

Pain

For the treatment of moderate pain, give Paracetamol tablet or syrup. This can be combined with codeine phosphate tablet or syrup, if the pain is severe.

Infection

1. Wash your hands thoroughly and keep ready sterile dressing. Avoid coughing over the wound or dressing.
2. Clean the wound gently with chlorhexidine solution or povidone-iodine solution using cotton swabs or gauze. While cleaning, move the swabs away from the wound using a fresh piece each time. Do not disturb the blood clot.
3. Small abrasions can be cleaned with water boiled and cooled previously. If chlorhexidine solution is not available, methylated spirit (denatured spirit) can be used for cleaning the skin surrounding the wound. If there is any contaminated material in the wound such as gravel, glass or wood, remove it gently. However, if such things are deeply embedded in the wound, do not try to remove. Cut the sterile gauze with a clean pair of scissors to a size large enough to cover the wound and adjacent skin. Apply chlorhexidine ointment or povidone-iodine ointment. Place the gauze over the wound. Cover it with cotton and bandage the part firmly. Then refer to the doctor. In case of small wounds, adhesive dressing such as a piece of sticking plaster may be used.
4. If the wound is contaminated, refer such cases to the doctor.

Suspected fractures

Suspect the possibility of a fracture (i) if you find pain and swelling, (ii) if the patient is unable to move the part or stand, or (iii) if you notice deformity in the limb contour. In any case, if you are in doubt treat it as a fracture:

1. Do not move the part concerned. Clean and cover the open wound, if present.

2. Using as support a piece of wooden plank or a cardboard or even a newspaper rolled and tied together, bandage the injured part so that the joint above and the joint below the fracture are both immobilized. While bandaging use plenty of padding such as cottonwool or pieces of cloth between the skin and the support used for immobilization. In case of a fracture of the arm, use a sling after bandaging.
3. Refer the patient to the doctor.

BURNS AND SCALDS

Burns are caused by contact with hot objects or due to fire and electricity. They are caused by dry heat while scalds are caused by moist heat such as boiling water or hot oil or steam. Burns are also caused by chemicals such as strong acids and alkalis.

How to treat?

1. Immediately immerse the part in clean cold water for about 10-15 minutes. This helps to relieve pain.
2. Cover the area with a clean cloth. Chlorhexidine/povidone-iodine ointment can be used if the skin is broken. If the patient complains of pain, give aspirin or Paracetamol with or without codeine. Advise him to drink plenty of fluids to maintain an adequate amount of urine output. Cases of severe burn may go into shock. Hence, refer the patient with severe burns to the hospital immediately.
3. In case of chemical burns, wash the area with plenty of water and remove the contaminated clothing.
4. Scalds may result from drinking extremely hot fluids or some irritant chemical. In such cases, the inner side of the mouth and throat would become red and swollen. Give cold water to drink or ice to suck followed by milk or egg emulsion to drink, and refer the patient to the hospital.

SHOCK

Shock is a dangerous state of collapse which may develop after severe injury or severe burn or following severe diarrhoea or heart attack.

The patient in shock looks pale, and his skin becomes cold. He sweats profusely. His blood pressure falls. His breathing and pulse are fast and, if untreated, death may occur. It is therefore important to prevent shock by appropriate treatment such as treatment of bleeding, pain or correction of fluid loss.

1. Do not move the patient in shock unnecessarily. Raise the legs provided there is no fracture. If he is lying on a cot, raise the foot end of the cot.
2. Give plenty of fluids. Do not give hot water bottles, and protect the patient from the direct sun. If necessary, cover him with a bedsheet or a blanket.
3. Do not give anything to eat or drink to a patient who has a suspected internal abdominal injury.
4. Refer the patient immediately to the doctor.

12. PEDICULOSIS

What is it?

Lice is a parasite living on the human skin, among the hair and on the clothes. The females lay eggs on hair; growth of hair brings the empty shells into view after the eggs have been hatched. Lice infestation is usually acquired through close contact with unclean persons, fellow inmates, from schools, shared clothing or bedding. It gives rise to itching. Secondary infection may occur following scratching.

When a person complains of itching in the head, look for the shining greyish eggs on the hair. Also enquire about the contacts and examine the hair of family members.

How to treat?

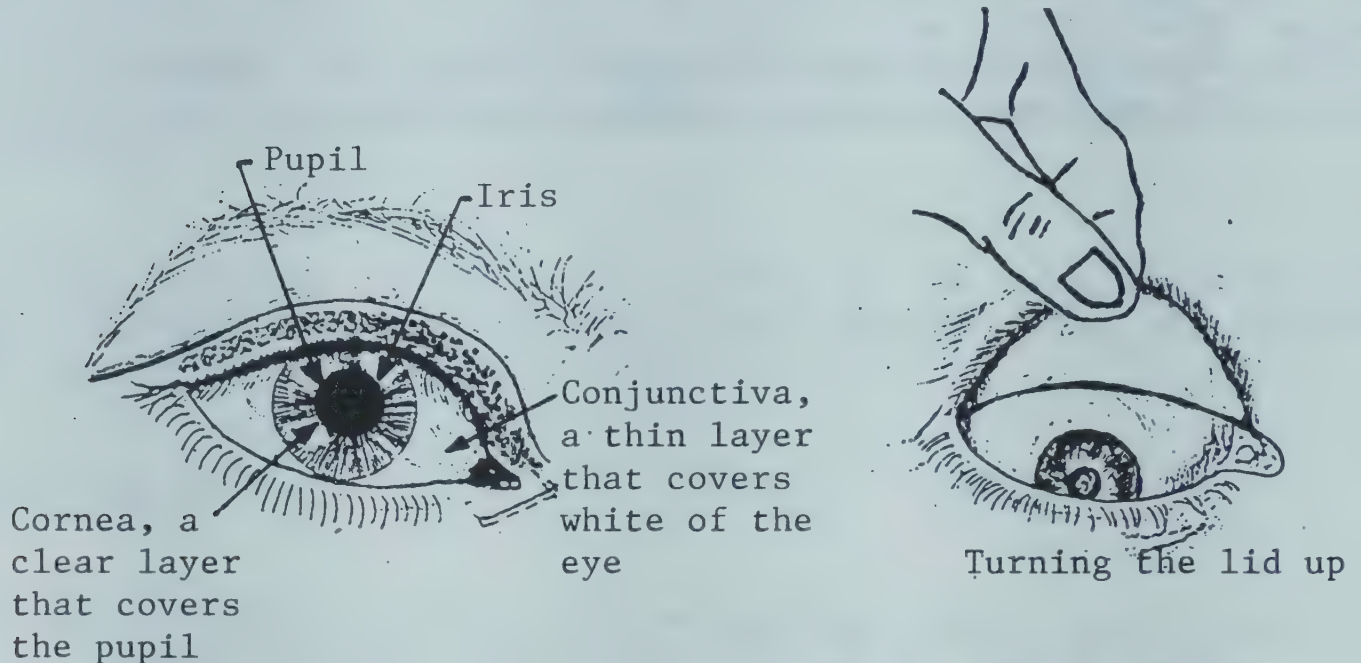
1. For body lice - use 5% DDT dusting powder. Apply the powder to the whole body and keep it for 24 hours. Then advise bath.
2. For head lice - 2% DDT dusting powder can be used and kept for 24 hours. Equally effective is a liquid preparation containing 0.2% gamma benzene hexachloride (gammaxene). It is applied to the hair, allowed to dry and followed by bath after 24 hours. A single application is enough. In cases of heavy infestation, scratching leads to secondary infection of the skin with pus formation. In such cases, it is advisable to cut the hair short and clean the skin with cotton swab dipped in hot water. The area is dried and then chlorhexidine ointment is applied.
3. If none of the above is available, application of kerosene is equally effective for head lice. Usually, two teaspoonsful of kerosene is rubbed into the whole scalp and the head wrapped in a piece of cloth. Two hours later, it is washed thoroughly with soap and water. The person should keep away from fire during this procedure.
4. Treat all the contacts, particularly the family members, simultaneously.
5. To destroy the lice and the eggs in the clothes, dip them in boiling water. Keep the bedding in direct midday sunlight for several days.

What precautions should be taken?

1. Avoid contact of drugs with eyes.
2. Wash the hands after application.
3. Do not use gamma benzene hexachloride repeatedly in children.
4. Keep the drugs at a safe place, away from children.
If swallowed, they can cause serious toxicity.

13. EYE PROBLEMS

The eye is vulnerable to an external insult. Three common conditions are (a) foreign body, (b) allergy, and (c) infection. If these are not treated promptly, the damage done may have an effect on vision. Hence, the treatment of these conditions must be undertaken promptly.



(a) Foreign body

This could be a small insect or a piece of grit or a loose eyelash. Tell the patient not to rub the affected eye. If possible, make him blink the eyelids, with the eye under clean water. If this is not effective, make him sit in good light. Wash your hands with soap and water and try to remove the foreign body gently by flushing the eye with clean water. For foreign body under the upper eyelid, turn the eyelid up and identify the foreign body and then remove it gently with moistened twisted cottonwool or a clean piece of cloth. In case the foreign body is in the lower lid, gently draw the lower lid down and out and identify the particle and remove it with a moistened wisp of cotton. Magnifying glass is useful for identifying and localizing the foreign body. After removal, tetracycline eye-ointment should be applied and the eye bandaged. Remember, if the foreign body cannot be easily wiped away or is embedded, do not try to remove it. In that case, cover the eye with a light bandage and refer the patient to the doctor.

Black or bruised eyelids (ecchymosis) do not need treatment if vision has not been affected.

(b) Eye allergy

Allergic conditions of the eye are caused by various substances in the surroundings such as dust particles, smoke, chemicals and pollens from flowers. They produce chronic redness of eyes and

itching without discharge. In the countryside they are common during the flowering and harvesting seasons. They are treated with zinc sulphate 0.2% eye drops, 2-3 drops thrice daily, for 7-10 days. If there is no relief, the patient should be referred to the doctor.

(c) Inflammation and infection

Acute infections of the eye occur due to bacteria or viruses. Eyes become red and there is often pain and foreign body sensation (sore eyes). This is an inflammation of the covering of the eye. It causes marked redness, mild pain and secretory discharge which may contain pus. Patients feel uncomfortable in bright light and prefer to keep away. There is difficulty in opening the eyelids, particularly in the morning, owing to a sticky discharge.

Trachoma is a chronic and infectious type of conjunctivitis. It is a major cause of blindness in many developing countries. Unlike acute conjunctivitis, it develops gradually over many months. In its early stage, it causes a slight swelling of the eyelids and running of the eyes due to increased secretion. The upper lid is usually the worst affected. This stage persists for many months. If untreated, abnormal fine blood vessels develop spreading from the periphery to the central region of the eye. The surface becomes granular. The eyelashes are inturned. This stage may last for 6 months or more. If untreated, scars are formed leading to opacity and blindness.

Trachoma is an endemic disease and is associated with low socio-economic and sanitary conditions. The disease spreads through flies. Reduction of household crowding, identification and control of the breeding sites of eye-seeking flies and improvement of personal hygiene should be actively encouraged.

How to treat infections?

1. Boil a glass of water with a pinch of salt and allow it to cool. Wash your hands with soap and water and wipe the eyes gently with clean cotton dipped in this water. Each time use a separate cotton swab.
2. Clean the lids. Pull down the lower lid and put tetracycline 1% eye-ointment 4-5 times a day. Chloramphenicol eye-ointment and eye drops can also be used for the same purpose if tetracycline eye-ointment is not available. The patient or his relatives should be instructed how to clean the eyelids and apply the ointment at home.
3. Follow up the patient carefully. If, after 3 days of tetracycline treatment, there is no improvement, the patient should be referred to the doctor. If there is improvement, continue the medication for 7-10 days.

4. Lid inflammations such as sty should be treated by the application of warm compresses and tetracycline eye-ointment 3-4 times a day for 3 days. People who get repeated sties or sore eyes should be referred to the doctor.
5. Sometimes newborn babies, within a few days after birth, suffer from red eyes with the swelling of lids and discharge. To prevent this, put tetracycline eye-ointment in both eyes only once or instil 1 to 2 drops of silver nitrate 1% eye-drops soon after birth, immediately after cleaning the eyes with boiled cool water.
6. If a person has a chronic eye complaint, such as trachoma mentioned above, refer him to the doctor for confirmation. Trachoma is curable if treated in the early stages. Locally, tetracycline 1% eye-ointment is applied 3 times a day for six weeks. In the early stages only eyedrops or ointment if used adequately would suffice.

In the long run, the local treatment with ointment has to be carried out by the affected person himself and therefore the patient or his relative should be given detailed instructions regarding the application of ointment.

In places where trachoma is endemic, for mass anti-trachoma treatment tetracycline ointment is applied to both eyes twice daily for 5 days every month for 6 months.

How to prevent the spread of sore eyes (conjunctivitis)?

1. Advise the patient with sore eyes to minimize physical contact with other people.
2. He should use a separate handkerchief or towel and wash it separately after use.
3. People with sore eyes should be advised not to bathe in canals or pond water used by others.
4. A child suffering from sore eyes (conjunctivitis) should not attend school during the attack.
5. Do not delay the treatment.

Prevention of blindness due to vitamin A deficiency

See Section on Vitamin A, page 56.

When to refer?

1. Accidental injury to eye.
2. Patients with loss or reduction of vision or double vision.
3. Patients with painful eye.

14. EAR PROBLEMS

Pain in the ear - ear-ache - may be due to wax in the ear or due to infection.

The wax is a normal secretion and provides a protective film over the ear-drum and should be removed only if it disturbs hearing. Wax can be softened by using sodium bicarbonate ear-drops containing 5 g. of sodium bicarbonate and 30 ml. of glycerine in 100 ml. of water. Another simple remedy is to use coconut oil or olive oil for softening the wax.

Do not use the drops or oil if there is discharge coming out of the ear or if the patient is known to have perforation of the ear-drum. Refer him to the doctor.

Pain in the ear may be due to a small boil in the external ear. If pulling of the ear gently causes pain, suspect the infection of the canal or tube going into the ear. The infection may be visible if the ear canal is examined in good sunlight or with the help of a torch, pulling the ear gently and observing the canal. Tetracycline 1% eye-ointment can be applied locally to treat the infection. Pain can be relieved by giving aspirin or Paracetamol with or without codeine. Refer the patient to the doctor.

Ear infection is common in children. The infection often begins during an attack of common cold or stuffy nose or diseases such as measles. There may be fever. The child becomes restless and cries continuously because of pain and does not allow touching the ear. In such cases, start oral co-trimoxazole and give Paracetamol to relieve pain and refer the child to the doctor. If such an infection is not treated in time, perforation of the ear-drum may occur.

All patients with chronic ear discharge, i.e., for more than 14 days, should be referred to the doctor.

15. SKIN PROBLEMS

Common skin problems are ringworm, boils, eczema and skin rashes. Many times skin rash is due to allergy. Sometimes, skin rash is due to diseases such as measles or chickenpox. Certain lesions on the skin may be due to an important systemic disease such as syphilis and leprosy.

General guidelines:

1. If the skin rash in a child is associated with fever, red eyes, bodyache, and running of the nose, suspect a systemic disease such as measles. Refer to the doctor.
2. If the affected skin area is warm and painful, suspect inflammation. Use a cloth moistened with hot water, squeeze and foment.
3. If the skin lesion itches and oozes but there is no pus, suspect eczema or allergy. Treat it with cold compresses using cloth dipped in cold water. Once the oozing is reduced, apply calamine lotion. Remember, fungus infections of the skin such as ringworm also give rise to itching; however, they usually occur in moist areas of the skin such as groin, armpits and waist and they present a typical picture. This should be treated with an antifungal drug (for details, see Ringworm Ointment, page 48).
4. If the skin shows a swelling, redness around the affected area, pain and pus, suspect infection. Impetigo is a bacterial infection that affects the skin, commonly the face. Clean the lesion with cotton or a clean cloth dipped in hot water and, after drying, apply chlorhexidine ointment or gentian violet. If the infection is severe with pus, refer the patient to the doctor.
5. Protect the affected skin areas from direct sunlight.

How to treat allergy?

Allergic reactions of the skin are characterized by rash which may be fine, raised papules or thick, raised spots or patches that look like bee stings, and produce itching. Such reactions could be due to eating or coming in contact with material which the patient cannot tolerate. The rash may come and go and re-appear when the patient comes in contact with same material or eats the food to which he is allergic. Hence, attempts should be made to find out the cause for

providing treatment. If detected, the cause(s) should be avoided by the patient. Locally, apply calamine lotion and, if the itching is severe, give the antihistaminic drug, chlorpheniramine. To protect babies from scratching the skin, cut the finger-nails very short and put on gloves.

How to treat boils?

Boils are caused because of infection of the hair roots. They are warm, raised, painful and may show a small whitish area in the centre. The skin around it may be swollen. Sometimes, multiple boils may occur giving rise to fever.

1. Foment the boil with hot water several times a day.
2. Usually small boils will break open by themselves. Continue applying hot compresses and allow the pus to drain. Apply gentian violet or chlorhexidine ointment or povidone-iodine ointment. If the patient also has fever, give penicillin tablets.

How to treat scabies?

See under Benzyl Benzoate, page 5.

How to treat fungus infection (ringworm)?

See under Ringworm Ointment, page 48.

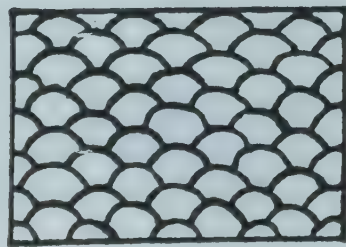
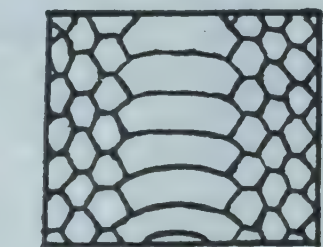
16. SNAKE BITES AND INSECT STINGS

Snake Bites

Although there are many types of snakes, only a few of them are poisonous.

How to distinguish between non-poisonous and poisonous snakes?

If the killed snake is brought by the victim, turn the snake on its back and observe ventral plates, then the head and the body. In the case of a non-poisonous snake:



1. The central plates do not extend right across the entire belly. Instead, the belly is covered with small scales or the last row of small scales which cover the back are visible on the under-surface of the snake.

2. There are no fangs - two large grooved or tubular teeth fixed to upper jaw. Instead there are several rows of small teeth.

3. The tail is markedly compressed.

If the snake is found to be non-poisonous, no treatment except local treatment is necessary. Reassure the patient.

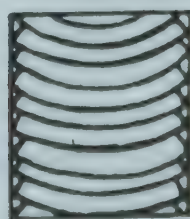
Poisonous varieties are:

1. Elapine snakes - e.g., cobra and krait. Characteristics are:



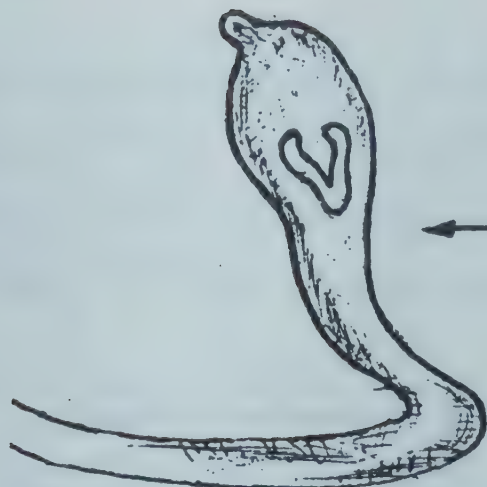
(a) The head is about the same width as the body, the neck not being distinguishable;

(b) The pupils are circular;



(c) The central plates completely extend across the belly, and

(d) The dorsal line of the scales is hexagonal.

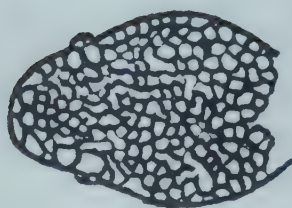


The cobra is usually 5-15 feet long, brown/dark, brown/golden yellow in colour. When aroused, it raises its head and spreads it as a 'hood', which has on its dorsal side a specific pattern.



The common krait usually measures 4-5 feet, and is shiny steel blue in colour with rows of paired white stripes across the body.

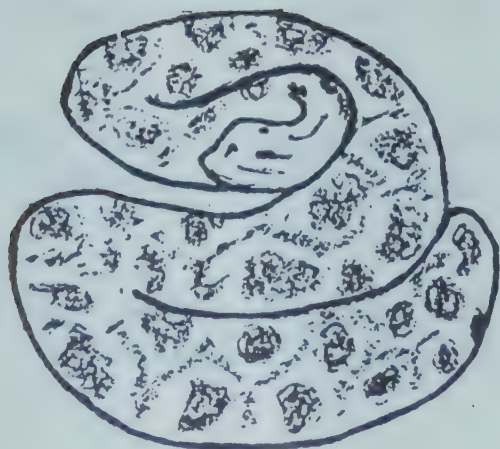
2. Viperine snakes e.g., Russel's viper, saw-scaled viper, pit viper. The characteristics are:



(a) the head is broad and pear (triangular)-shaped with a distinct neck.

(b) the head is covered entirely by small scales of the size as those covering the body.

(c) central plates completely cover the body and pupils are vertical.



Russel's viper is brown/amber in colour, has an angular snout and large fangs. It has a characteristic pattern of triple rows of oval spots, running along the entire length of the body.



The saw-scaled viper is smaller in length - 1 to 2 feet - brown/greyish brown in colour and has a triangular head with a typical white arrow mark. It has a characteristic diamond-shaped pattern on the back extending from head to tail.

The pit viper is distinguishable by a pit between the eye and the nostril.

Cobra and Krait

- Toxin acts on nerves
- Local burning, stinging pain but negligible blood oozing
- Local swelling may be present
- No local sloughing
- There is drooping of eyelids. Patient feels giddy, weak; limbs get paralysed. Breathing becomes difficult and death occurs due to failure of respiration.

Vipers

- Toxin acts on blood
- Intense and persistent local pain with oozing of blood from punctures
- Marked local swelling
- Local sloughing occurs
- There is nausea, vomiting and characteristic bleeding from nose, gums and in urine. Patient may collapse due to blood loss. Blood does not clot easily.

How to treat?

The following first-aid treatment should be carried out in all suspected cases immediately without wasting time. If the person is suspected to have been bitten by a snake, immediate arrangements should be made to send him to a PHC for anti-snake venom. This is the only life-saving measure available. No other remedy is known to substitute the antivenom serum.

1. Give assurance to the patient. Remember, fear of death may cause shock.

2. Apply a light tourniquet by a strip of cloth, a handkerchief, a cord or a rubber-band to the thigh in case of a leg bite and to the arm in the case of a hand bite. The purpose of the tourniquet is to compress the tissues above the bite and delay the venom getting into the general circulation during transit to PHC.
3. Avoid movements of the bitten part. It should be immobilized by means of a splint. Movement of the bitten part hastens absorption of the venom in spite of the tourniquet.

Scorpion Stings

The scorpion has a sting on its tail which it uses for defence. This sting contains venomous glands (poisonous) and the venom is injected into the victim. It usually causes local pain which can be severe, may last some hours or even 1-2 days. General symptoms are exceptional but some venoms cause bodyache, vomiting, sweating, excessive salivation and rapid breathing. In very severe cases, blood pressure falls and death can occur due to toxic effects on the heart.

For the treatment of pain, use Paracetamol tablet with or without codeine. Give the patient plenty of fluids. At the place of bite, put a few crystals of potassium permanganate and add a drop of lemon juice. The venom will get oxidized and pain will be relieved.

Bee and Wasp Stings

A single bee or wasp sting may cause mild local reaction and pain. This can be treated easily by the local application of ice or diluted vinegar. Reactions may be severe with multiple stings, sometimes leading to shock. Such patients should be immediately taken to the hospital. In patients with reactions, give one tablet of ephedrine followed by tablet chlorpheniramine thrice daily for 3-4 days.

17. POISONING

Poisoning may be due to the swallowing of poisonous substances either accidentally or intentionally. Poisoning can occur in children from the consumption of berries from plants which are poisonous. Acute poisoning may also occur due to ingestion of contaminated food. In all cases of poisoning, the poison such as chemicals or tablets or containers should be saved, if available, for the doctor to examine. The vomit should also be preserved for identifying the poison.

How to treat poisoning?

1. If the patient is conscious, observe him carefully. If there is no vomiting, make him vomit by tickling the back of his throat. If this does not work, give him plenty of water containing 4 tablespoonfuls of common salt to each tumbler of water. Vomiting will not help if the patient presents too late - more than 4 hours after the ingestion of poison.

Do not induce vomiting if you suspect the poison to be corrosive or a petroleum product. With corrosive poison such as strong acid and alkalis, the lips and mouth may show greyish white stains.

2. Following vomiting, dilute any poison left in the stomach by asking the patient to drink milk or beaten eggs. Alternatively, one can also use charcoal powder. It is available as charcoal powder (activated) and is particularly useful for preventing the absorption of poisons which are toxic in small amounts. Charcoal powder is not useful in poisoning due to acids and alkalis. It is prepared by dissolving 4 tablespoonfuls of powder in about 400 ml. (2 glassfuls) of water and half a glass is given to drink every 15 minutes. It is quite safe. If charcoal is not available, the powder of burnt bread can be used.
3. If the patient is unconscious, put him in a position lying on one side with head tilted slightly backwards so that choking due to falling back of his tongue is prevented. This position will also allow secretions to drain from the mouth. If the patient has stopped breathing, he would need artificial respiration.

Refer all cases of poisoning to the doctor along with samples of residual poisons, vomit and containers.

